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NASA TM X-3494

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NASA AVIATION SAFETY REPORTING SYSTEM: SECOND QUARTERLY REPORT JULY 15-OCTOBER 14, 1976

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Moffett Field, Calif. 94035

and

Aviation Safety Reporting System Office,
Battelle's Columbus Division
Mountain View, Calif.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • DECEMBER 1976

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
NASA TM X-3494		

4. Title and Subtitle	5. Report Date
NASA AVIATION SAFETY REPORTING SYSTEM: SECOND QUARTERLY REPORT, JULY 15–OCTOBER 14, 1976*	December 1976
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No. A-6860
	10. Work Unit No. 515-51-11-01
9. Performing Organization Name and Address Ames Research Center, Moffett Field, Calif. 94035 and Aviation Safety Reporting System Office, Battelle's Columbus Division, Mountain View, Calif.	11. Contract or Grant No.
	13. Type of Report and Period Covered Technical Memorandum
12. Sponsoring Agency Name and Address National Aeronautics and Space Administration Washington, D. C. 20546	14. Sponsoring Agency Code

15. Supplementary Notes

*See also NASA ASRS Quarterly Report Number 76-1, 4-15-76 through 7-14-76. Washington, D.C., National Aeronautics and Space Administration report, TM X-3445, September, 1976.

16. Abstract

During the second quarter of the Aviation Safety Reporting System (ASRS) operation, 1497 reports were received from pilots, controllers, and others in the national aviation system. Details of the administration and results of the program to date are presented. Examples of alert bulletins disseminated to the aviation community are presented together with responses to those bulletins. Several reports received by ASRS are also presented to illustrate the diversity of topics covered by reports to the system.

17. Key Words (Suggested by Author(s))	18. Distribution Statement
Aviation safety Incident reporting Human factors Warning system	Unlimited STAR Category – 03

19. Security Classif. (of this report)	20. Security Classif. (of this page)	21. No. of Pages	22. Price*
Unclassified	Unclassified	69	$4.25

*For sale by the National Technical Information Service, Springfield, Virginia 22161

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JULY 15 – OCTOBER 14, 1976

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SUMMARY

During the second quarter of the Aviation Safety Reporting System (ASRS) operation, 1497 reports were received from pilots, controllers, and others in the national aviation system. Details of the administration and results of the program to date are presented. Examples of alert bulletins disseminated to the aviation community are presented together with responses to those bulletins. Several reports received by ASRS are also presented to illustrate the diversity of topics covered by reports to the system.

INTRODUCTION

This is the second in a series of reports describing the activities of the NASA Aviation Safety Reporting System (ASRS).[1] It covers the period from July 15, 1976 through October 14, 1976, the System's second quarter of operation under a Memorandum of Agreement signed on August 15, 1975 by the National Aeronautics and Space Administration and the Federal Aviation Administration.

This report discusses certain aspects of the methodology and presents data regarding telephone callbacks to reporters and time to deidentification of reports. The results of the second quarter's operation are presented, with tabulations of several types of descriptive data. These results suggest that the sources of ASRS data, and possibly the subject matter of reports, have changed somewhat from the reports submitted during the first 3 months of ASRS operations.

A short general discussion of ASRS intake, operational methods, and the problems encountered follows. The preparation of the computer database is briefly described.

Appendix A presents a number of examples of alert bulletins disseminated by the ASRS, with responses to those bulletins. Many of the alert bulletins illustrate types of data discussed in the body of the report. A second appendix contains a sample of deidentified ASRS reports, some of

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*Battelle's Columbus Division, Mountain View, California.

[1] See also NASA ASRS Quarterly Report Number 76-1, 4-15-76 through 7-14-76. Washington, D.C., National Aeronautics and Space Administration report, TM X-3445, September, 1976.

which illustrate specific points made in the report. Others are included to illustrate problems in the operation of the national aviation system.

SECOND QUARTER REPORTS: SUBMISSION CHARACTERISTICS

Number of Reports

The material used for this report includes 1497 reports received between July 15 and October 14, 1976. During the previous quarter, 1464 reports were received. All reports received during the second quarter were initially screened by NASA personnel, then processed, deidentified, and analyzed by the professional staff of Battelle's Columbus Division at its Aviation Safety Reporting System Office in Mountain View, California.

TABLE 1.– FREQUENCY OF CALLBACKS TO REPORTERS

[July 15 – October 14, 1976]

Type of callback	Number of reports	Percent of 1497 reports
Not tried	1157	77
Tried and completed	270	18
Tried, but not completed[a]	70	5
	Total	100

[a]The effort to complete certain calls was discontinued after 5 days in the interest of deidentifying reports in a "reasonable" time period beyond the prescribed 2 working-day goal.

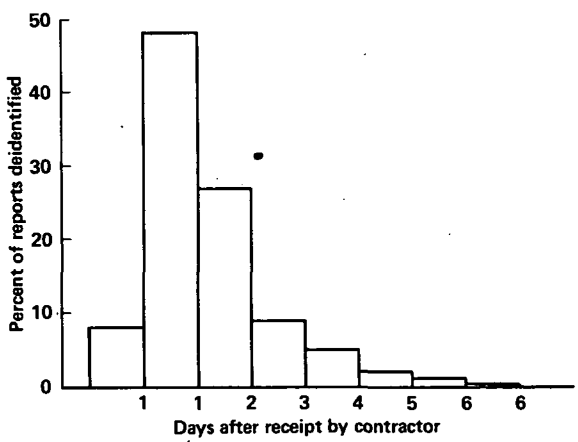


Figure 1.– Deidentification of ASRS reports.

Callback Actions

During the second quarter, attempts were made to augment the information contained in 340 reports by telephone contact with the reporter, compared with about 150 in the earlier period. These attempts were successful in 270 cases (table 1).

Deidentification of Reports

The Battelle ASRS staff made every effort to deidentify reports promptly in accordance with the Memorandum of Agreement. As shown in figure 1, 80 percent were deidentified within 2 working days. It was found, however, that to reach reporters by telephone often required keeping reports in identifiable form longer than 2 days. Some efforts to contact reporters were discontinued after 5 days of unsuccessful attempts. In other cases, the importance of augmenting the original information dictated continued efforts over as much as 16 days from receipt of the original report. Criteria for postponing deidentification include omissions or ambiguities in the original report, especially if the report suggests the existence of a serious hazard.

Experience indicates the desirability of more callbacks than have been made to date. Appendix B, cases 1 and 2, exemplify the

potential yield from this approach. Very few anonymous reports have been received, a continuation of the first quarter's experience. The information is available, therefore, to permit a further increase in the number of callbacks.

Reporter Involvement in Occurrences

The ASRS is used primarily as an occurrence reporting system (table 2). In over three-fourths of the reports received this quarter, the reporter was a direct participant in the described occurrence.

Sources of Reports

During the first quarter of ASRS operations, pilots and other aircrew members provided almost two-thirds of the reports submitted. During the second quarter, in which an almost equal number of reports was received, the proportion of reports from aircrew dropped to about one-half of the total received (table 3). There was a corresponding increase in reports from air traffic controllers. The increase in controller participation may indicate increasing confidence in the limited waiver of disciplinary action promised by the FAA, together with strong support of the ASRS concept by the controller representative organization. The decline in pilot reports is unexplained at this time.

TABLE 2.– DEGREE OF REPORTER INVOLVEMENT IN REPORTED OCCURRENCE

[July 15 – October 14, 1976]

Category	Percent of 1497 reports
Direct participant[a]	78
General concern[b]	15
Immediate observer[c]	7
Total	100

[a]First-hand account as perceived by a reporter who was involved in the reported occurrence.

[b]Explicitly stated problem or recommendation is a result of repeated personal experiences, either as a direct participant or an immediate observer.

[c]Someone who perceived occurrence first hand but who was not directly involved.

TABLE 3.– TYPE OF REPORTER

[July 15 – October 14, 1976]

Reporter category	Percent of 1497 reports
Pilots and other aircrew	50
ATC personnel	48
All others, including passengers	2
Total	100

Multiple Reports of Occurrences

A potential shortcoming of the ASRS concept as implemented is that only the reporter's version of an occurrence is available for analysis. Independent verification of the reporter's statements is not permitted under present operating rules. One way to evaluate the seriousness of this shortcoming is to examine multiple reports of the same occurrence with regard to the degree of disagreement among the reporters as to the "facts" of the reported occurrence. During this quarter, 4 percent of the reported occurrences were reported on by more than one person; these multiple reports accounted for 10 percent of the total volume (table 4). Though there were discrepancies among some of the reports, it appears that most of the versions of these occurrences were consistent and reasonably objective. Callbacks also tended to confirm this conclusion. (See appendix B, reports 2–5).

TABLE 4.– MULTIPLICITY OF REPORTERS AND REPORTS ON THE SAME OCCURRENCE

[July 15 – October 14, 1976]

Number of reports for a given occurrence	Percent of 1497 reports
One only	90
Two[a]	7
Three[a]	2
Four[a]	1
Total	100

[a]A separate report was submitted by each different reporter.

TABLE 5.– REPORTER INCLUDED RECOMMENDATION IN WRITTEN NARRATIVE[a]

[July 15 – October 14, 1976]

Category	Percent of 1497 reports
None[b]	49
Worthy of further consideration[c]	46
Based on incomplete knowledge	5
Total	100

[a]Any new recommendations stated by reporters during callbacks are not included in this data.

[b]In many cases a recommendation was implied in the reporter's narrative, but this type of report is listed here in the "None" category.

[c]Explicitly stated recommendation appears to have validity, at least from the reporter's viewpoint.

Recommendations by Reporters

Over half of the reporters included in their reports one or more recommendations for solution of a safety problem that they identified (table 5). While some of these suggestions indicated an incomplete knowledge of the aviation system or the problem under discussion, far more were reasonable; some were extremely imaginative and perceptive. Much thought obviously went into these reports (appendix B). Their considerable numbers suggests that far more than simply a desire to avoid punishment for a rule infraction motivates reporters to use the ASRS.

SECOND QUARTER REPORTS: CHARACTERISTICS OF OCCURRENCES

ASRS Report Form

The ASRS report form (fig. 2) requests several types of information from all reporters. The structured portion of the form is similar in content to the FAA's earlier ASRP form 8020-12. Though shortcomings in items 1–14 have been apparent since early in the program, especially with regard to the inclusiveness of items 5, 11, 13, 14, many useful categories of information can be obtained from them. Some that were susceptible to manual tabulation are presented in the following pages.

Geographic Locations of Occurrences

The geographic locations of occurrences that led to ASRS reports during the second quarter are summarized in table 6. For the most part, the distribution reflects states with high general aviation and air carrier aviation activity. The inclusion of the Virgin Islands reflects a special situation in that area that was the subject of alert bulletins (appendix A, No. 1) and FAA action to resolve the problem. A sharp decrease in reports from that area was noted during the last half of the reporting period. Alaska's high volume of general aviation activity and its sparsely settled character have given rise to certain unique problems that have been addressed in alert bulletins. An example is found in appendix A, bulletin No. 2.

Please fill in appropriate spaces and circle or check all terms which apply to this occurrence or incident.

1. Location: *(Geographic (including State), airport, runway, ATC facility and sector, navigation aid reference, etc.)*

2. Type of operation:

SCHEDULED AIR CARRIER		SUPPLEMENTAL CARRIER		CORPORATE AVIATION		MILITARY: ARMY	
DOMESTIC OPERATION		CHARTER OPERATION		PERSONAL BUSINESS		NAVY/CG/MC	
INTERNATIONAL OPN.		UTILITY OPERATION		PLEASURE FLIGHT		AIR FORCE	
AIR TAXI		AGRICULTURAL OPN.		TRAINING FLIGHT		GOVERNMENT	

3. Type of aircraft:

FIXED WING, LOW		RETRACTABLE GEAR		RECIPROCATING		GROSS WT.: <2500		25,000-50,000	
HIGH WING		CONST. SPEED PROP		TURBOPROP		2500-5000		50,000-100,000	
ROTARY WING		FLAPS		TURBOJET		5000-12,500		100,000-300,000	
NO. OF SEATS:		NO. OF ENGINES:		WIDE BODY JET		12,500-25,000		OVER 300,000	

4. Second aircraft TYPE: *(if two aircraft involved)*

5. Reported by: **PILOT** **CREWMEMBER** **CONTROLLER** **OTHER** *(specify)*

If pilot: **TOTAL HOURS:** **HRS. LAST 90 DAYS:**

6. Light conditions: **DAWN** **DAYLIGHT** **DUSK** **NIGHT**

7. Altitude: **FEET MSL.**

8. Flight plan: **IFR** **VFR** **DVFR** **SVFR** **NONE**

9. Flight conditions: **VFR** **IFR**

10. Flight phase: **PREFLIGHT** **TAXI** **TAKEOFF** **CLIMB** **CRUISE** **DESCENT** **HOLDING** **TRAFFIC PATTERN** **APPROACH** **LANDING** **MISSED APPROAC..**

11. Airspace: **POSITIVE CONTROL AREA (PCA)** **TERMINAL CONTROL AREA (TCA)** **ON AIRWAYS** **AIRPORT TRAFFIC AREA** **UNCONTROLLED AIRSPACE**

12. Air Traffic Control: **GROUND** **TOWER** **DEPARTURE** **CENTER** **APPROACH** **FSS** **NONE**

13. Weather factors: **RESTRICTED VISIBILITY** **TURBULENCE** **THUNDERSTORM** **AIRCRAFT ICING** **CROSSWIND** **PRECIPITATION** **NONE** **OTHER** *(specify)*

14. *(Circle all which you believe apply to this occurrence)*

AIRPORT **AIR TRAFFIC CONTROL** **AIR NAVIGATION FACILITY** **AIRCRAFT**

FLIGHT CREW **AERONAUTICAL PUBLICATIONS/CHARTS** **OTHER** *(specify below)*

15. **NARRATIVE DESCRIPTION:** *(Please describe the occurrence as clearly and precisely as possible. Include information on: what happened . . . how was the problem discovered . . . what actions were taken . . . was evasive action required . . . what factors contributed to the situation . . . why do you believe the situation occurred . . . your suggestions as to how to prevent a recurrence.*
USE BOTH SIDES OF THE FORM, AS REQUIRED.)

Figure 2.– NASA ARC Form 277: Aviation Safety Reporting Form.

TABLE 6.– GEOGRAPHIC LOCATION OF REPORTED OCCURRENCES

[July 15 – October 14, 1976]

State or territory	Rank order		Percent of 1497 reports
California	1		11
New York	2		9
Pennsylvania	3		8
Texas	4		7
Colorado	5		5
Florida	6		4
Illinois	7		4
Ohio	8		4
Alaska	9		3
Virgin Islands	10		3
		Subtotal	58
All other 46 states and territories	11–56		42
		Total	100

Types of Operations

Types of flight operations are summarized in table 7. This information may be misleading in one sense, because reports involving multiple aircraft (e.g., near midair collision reports) often contained only the operational category of the aircraft known to the reporter.

Most military reports received to date have been provided to ASRS through the cooperation of the USAF Directorate of Aerospace Safety, whose Hazardous Air Traffic Reports are routinely forwarded to ASRS if they involve an interface problem between military and civil operations. These reports have been extremely helpful, as have the Air Force's comments on alert bulletins describing certain interface problems (see appendix A, bulletin Nos. 3 and 4).

TABLE 7.– TYPE OF OPERATION LISTED IN OCCURRENCE REPORTS

[July 15 – October 14, 1976]

User category	Rank order	Percent of 1497 reports
Air carrier – domestic and international	1	45
Reports applicable to various types of operations[a]	2	21
Pleasure and training	3	16
Corporate and personal business	4	11
Military services	5	5
Utility	6	2
	Total	100

[a]Includes two or more of the possible choices appearing on the ASRS Report Form.

Flight Plans

The flight plans governing the operation of aircraft involved in occurrences are shown in table 8. It is interesting to note that some type of flight plan had been filed in 84 percent of the flights described in ASRS reports. This may be indicative of a low level of participation in the system by those general aviation pilots who frequently do not file flight plans.

Airspace

Table 9 lists the categories of airspace within which occurrences were described. It is worthy of note that at least three-fourths of all reports involved controlled airspace (airspace within which some or all aircraft may be subject to air traffic control).

TABLE 8.– FLIGHT PLANS FILED

[July 15 – October 14, 1976]

Type of flight plan	Percent of 1497 reports
IFR	56
No flight plan	16
Applicable to various flight plan types[a]	14
VFR	13
DVFR or SVFR	1
Total	100

[a]Includes two or more of the choices appearing on the ASRS Report Form.

Air Traffic Control

The type of air traffic control that was being exercised at the time of reported occurrences is shown in table 10. It should be remembered that this tabulation in no way suggests that these control facilities were necessarily involved in the occurrences reported; on the contrary, some reporters expressed gratitude to controllers who assisted them during a mechanical or operational problem (appendix B, report 17). The table does point out, however, that the preponderance of ASRS reports is coming from pilots who are in contact with, and in over half the cases are being controlled by, the air traffic control system.

TABLE 9.– FAA AIRSPACE JURISDICTION DURING REPORTED OCCURRENCES

[July 15 – October 14, 1976]

Type of airspace	Rank order	Percent of 1497 reports
Airport traffic area	1	31
On airways	2	20
Applicable to various types of airspace[a]	3	18
Terminal control areas	4	14
Positive control airspace	5	11
Uncontrolled	6	6
	Total	100

[a]Includes two or more of the possible choices appearing on the ASRS Report Form.

TABLE 10.– AIR TRAFFIC CONTROL DURING OCCURRENCES REPORTED TO ASRS

Controlling facility	Percent of 1497 reports
ARTCC (center)	23
Approach control	22
Tower (local control)	21
Report applicable to various ATC facilities and functions[a]	13
Aircraft not under ATC control or communicating with ATC	9
Departure control	6
Ground control	3
Flight service station	3
Total	100

[a]Includes two or more of the choices appearing on the ASRS Report Form.

Phase of Flight

The phase of flight during which occurrences were noted is shown in table 11. Almost one-third of reports described situations that reporters felt were of general applicability (e.g., appendix B, No. 9).

TABLE 11.– PHASE OF FLIGHT DURING REPORTED OCCURRENCES

[July 15 – October 14, 1976]

Flight phase	Rank order	Percent of 1497 reports
Applicable to various flight phases[a]	1	32
Cruise	2	20
Approach	3	13
Climb	4	10
Takeoff	5	6
Descent	6	6
Preflight and taxi	7	5
Holding, traffic pattern and missed approach	8	4
Landing	9	4
	Total	100

[a]Includes two or more of the possible choices appearing on the ASRS Report Form.

If reports applicable to several or all phases of flight are excluded, the remainder are distributed as shown in table 12, which also shows data from the previous quarter's report.

The figures for the two quarters are generally consonant. Occurrences during approach and landing represent roughly one-third of phase-specific reports, and this phase is most commonly represented in occurrence reports, as in aircraft accident data (see appendix B, reports 10–13). It should be noted, however, that these occurrence data came from the 6 months when the weather is least severe; comparatively few reports thus far have mentioned problems similar to those often cited in approach and landing accidents. The comparison of these data with those of the NTSB must await a winter's experience with ASRS occurrence reporting.

TABLE 12.– PHASE OF FLIGHT, EXCLUDING REPORTS APPLICABLE TO SEVERAL PHASES

Flight phase	First quarter, percent of 1300 reports[a]	Second quarter, percent of 1000 reports[a]
Preflight and taxi	7	7
Takeoff and climb	20	24
Cruise	25	30
Descent	18	9
Approach and landing[b]	30	31
	~100	~100

[a]Reports rounded to nearest hundred.
[b]Includes traffic pattern, missed approach, and holding

Weather and Light Conditions

Meteorological conditions are summarized in tables 13 and 14. Table 13 summarizes the light conditions at the time of occurrences. Three-quarters of the reported occurrences took place during daylight, although a setting sun combined with haze was mentioned as a contributing factor in a number of instances. These occurrences occurred during the half of the year in which daylight is

TABLE 13.– LIGHT CONDITIONS DURING OCCURRENCES

[July 15 – October 14, 1976]

Light conditions	Percent of 1497 reports
Daylight	74
Applicable to various light conditions[a]	15
Nighttime	8
Dawn and dusk	3
Total	100

[a]Includes two or more of the possible choices appearing on the ASRS Report Form.

TABLE 14.– WEATHER CONDITION DURING REPORTED OCCURRENCES

[July 15 – October 14, 1976]

Type of weather	Percent of 1497 reports
None	50
Applicable to various types of weather[a]	30
Restricted visibility	13
Thunderstorms	3
Precipitation	2
Turbulence	1
Crosswind	1
Icing	0
Total	100

[a]Includes two or more of the possible choices appearing on the ASRS Report Form.

preponderant. Night operations, especially under conditions of restricted visibility, pose special problems (appendix B, reports 14–16).

Specific weather problems were mentioned in only 20 percent of occurrence reports. Restricted visibility accounted for more than half of this fraction. It should be noted that controller reports may not cite weather except for thunderstorms, even if it is posing a problem for the involved pilot. It is likely, therefore, that meteorological factors may be under-reported. Examples of weather as a factor in occurrences are seen in appendix B, reports 17–19.

Problems Discussed in ASRS Reports

It has been ASRS practice, during its initial period of manual operation, to assign problem codes to each report after processing. These problem codes have been useful, for they have permitted searches of subsets of the processed data. They are deficient, however, in that only one problem code may be assigned to a report. Also, not all of the categories are of the same kind. The first six codes, for instance, refer to possible causative factors, while the last three represent occurrence types and relate to outcome, rather than causation. As the data are entered into the ASRS information management system, these problem codes will become redundant. Nonetheless, at this stage in the System's development, they provide at least a first-order impression of the types of problems being submitted to ASRS. They are presented with the cautionary note that they are at best an incomplete characterization of the data. The classification is as follows:

Control Functions

- ATC denotes an air traffic control function of some kind.
- FLC denotes a flight crew function of some kind.

- NAV denotes a problem associated with airborne or surface navigation, guidance, or communications equipment or facilities.

- ACF denotes a problem associated with an aircraft structure or subsystems.

- APT denotes a problem associated with an airport or its subsystems.

- PUB denotes a problem associated with a publication (textual or graphic) used in aviation, including computer software.

Outcome-Oriented Problem Codes

- NMA denotes a near midair collision or potential physical conflict between aircraft, usually as perceived by a flight crew member. (Less than standard separation, as perceived by a controller, is usually coded under ATC in the case of a system deviation or error, or FLC in the case of a pilot deviation.)

- ACC denotes an aircraft accident within the meaning of 49 CFR 830.

- OTH is a category for all other reports which cannot be assigned one of the eight problem codes defined above.

Figure 3 shows the distribution of reports during the reporting period. ATC reports comprised 40 percent of the total, a figure virtually identical to the first quarter's experience. FLC reports were the next largest segment of the data; this code was assigned to 22 percent of the reports in the second quarter and to 20 percent during the first quarter. Since these two codes often imply a human error of some kind, it can be inferred that more than half of all ASRS reports involve some kind of human error.

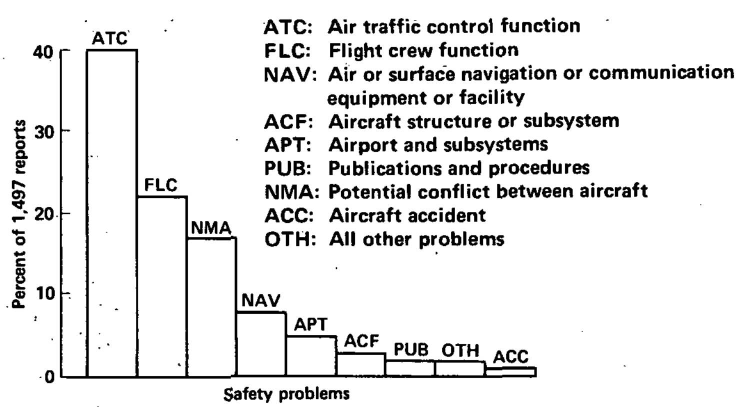


Figure 3.– Distribution of reports by problem code

Reports 20–32 of appendix B describe problems coded in these categories (ATC and FLC). Numbers 20 and 21 illustrate problems in complying with ATC instructions, a not infrequent complaint in ASRS reports. Reports 22, 23, and 24 illustrate the very common problem of transfer of numerical information by verbal communications. Report 23 makes mention of procedures that tend to minimize this problem when they are adhered to by controllers.

Just as certain practices of controllers cause difficulties for pilots (appendix B, report 21), so certain practices by pilots can cause severe problems for controllers. Report 25 describes a practice that has been cited several times because of its disruption of the controller's traffic flow planning. It

appears from a number of reports that the control of traffic and the required procedures in terminal radar service areas (TRSA) are fairly widely misunderstood by pilots. This report makes its points very clearly.

Another controller report, appendix B, No. 26, discusses another phase of air traffic control that is frequently cited as a problem, that of the handling of military traffic at the interface between joint use airspace and military operations areas. Appendix A, alert bulletin No. 4, also bears on this problem.

Several typical flight crew errors are cited in appendix B, reports 27–32. Report 32, from a controller, is explicit about the problems caused by a pilot's unwillingness to declare an emergency, a point often emphasized in airman education programs.

Potential Conflicts Between Aircraft

During the second quarter, approximately one-third of all ASRS reports received involved less than "standard" separation between two or more aircraft. About 16 percent were described by reporters as "near midair collisions" or some equivalent term. In order to assess the perceived seriousness of these potential conflicts, estimated miss distances were tabulated as a function of whether evasive action was taken (table 15). Note that these data were derived solely from the information given by reporters; no attempt was made to verify the data. It is known from some multiple reports that pilots' perceptions of miss distance vary considerably (appendix B, reports 4a and 4b). It should also be noted that table 15 includes *all* reports of potential conflicts between aircraft in-flight, not only "near midair collisions."

We do not know how many of these potential conflicts were known to crew members of both aircraft, or in how many the other pilot had already taken corrective action. Further, since the ASRS is a voluntary reporting system, it is not possible to deduce from these data any estimate of

TABLE 15.– POTENTIAL CONFLICTS BETWEEN AIRBORNE AIRCRAFT IN ASRS REPORTS[a]

[July 15 – October 14, 1976]

Evasive action taken?	Number of reports	Reporter's estimate of miss distance[b]			
		V < 250 ft *or* H < 500 ft	V 250–500 ft *or* H 500–1000 ft	V > 500 ft *or* H > 1000 ft	Not specified
Yes	218	101	29	28	60
No	154	32	24	75	23
Not reported	90	36	6	14	34
No time	31	21	0	4	6
Total reports	493	190	59	121	123
Percent of total	100	39	12	24	25

[a]Potential conflict is defined as any perceived problem relating to risk of airborne collision, from "Less than Standard Separation" to "Near Midair Collision, too Close for Evasive Action."

[b]Miss distance estimate ranges are shown as "V" (vertical) or "H" (horizontal).

the magnitude of the problem of potential encounters in U.S. airspace. All that can be said at this juncture is that a problem appears to exist, and even that statement must be tempered by our knowledge that actual midair collisions are uncommon aircraft accidents. In this respect, the disparity between ASRS data and aircraft accident experience is striking and remains to be explained, hopefully by more detailed analyses of the data.

The altitudes at which the potential conflicts occurred are shown in table 16. Ten percent took place above 18,000 ft (FL 180); only 20 percent of these required evasive action, though it will be recalled that this is positive control airspace. One-third occurred below 3000 ft; evasive action was taken in more than half of these. This altitude stratum includes all conflicts in airport traffic patterns and a small number of occurrences involving low-altitude military training routes.

TABLE 16.– REPORTED ALTITUDE IN POTENTIAL CONFLICTS BETWEEN AIRCRAFT[a]

[July 15 – October 14, 1976]

Evasive action taken?	Number of reports	Reported altitude, ft			
		Below 3000	3000–18,000	Above 18,000	Not specified
Yes	218	92	106	10	10
No	154	30	81	29	14
Not reported	90	26	48	10	6
No time	31	11	18	1	1
Total reports	493	159	253	53	31
Percent of total	100	32	51	11	6

[a]Potential conflict is defined as any perceived problem related to the risk of airborne collision, from "Less than Standard Separation" to "Near Midair Collision, too Close for Evasive Action."

Further and more detailed analyses of this category of reports will be presented in subsequent reports in this series. (See appendix B, reports 40–44, for examples of reports in this category.)

Returning to figure 3, each of the other problem codes accounted for less than 10 percent of the data, though such reports accounted for a larger proportion of alert bulletins. Many reports in these categories described specific problems amenable to correction; examples are described in appendixes A and B, reports 33–39 and 45.

ASRS ALERT BULLETINS

Fewer alert bulletins were submitted during the current quarter than during the initial 3 months of operation. Cumulative Alert Bulletin statistics are shown in table 17. The smaller number is due in part to a gradual refinement of criteria for generation of such bulletins; it may also reflect the transfer of processing responsibility for reports to analysts with more expertise in specific areas of aviation operations. This point will be reexamined during the third quarter of ASRS operations.

TABLE 17.– ALERT BULLETINS; PROBLEMS BY CATEGORIES

Category		1st quarter (4/15–7/14/76)	2nd quarter (7/15–10/14/76)	Total
Hardware:	navigation	13	4	17
	communication	11	3	14
	aircraft	4	0	4
	other	1	0	1
Software:	regulations and procedures	24	12	36
	navigation charts	10	7	17
	computer	5	1	6
	AOM	1	0	1
Liveware:	communications problems	15	7	22
	management problems	8	3	11
	other	7	2	9
Environment:	airport problems	21	19	40
	surface hazards	6	0	6
	airborne hazards	5	0	5
	Totals	131	58	189

Alert Bulletins are prepared when it is believed, on the basis of one or more ASRS reports, that one or more of the following exists:

1. A physical hazard that poses a threat to aircraft operating within the bounds of accepted operating practices in a given location.

2. An operational, regulatory or procedural hazard that poses a threat to aircraft operating within the bounds of accepted operating practices.

3. A regulation, procedure or other document is unclear, ambiguous, or misleading.

4. An accepted operating practice, applied in one or more locations, contravenes generally accepted or understood rules or regulations.

5. Some device necessary to safe operation displays a persistent pattern of malfunction which poses a threat to aircraft operating within the system.

Alert Bulletins are not often prepared when an occurrence involving simply a singular human error with respect to operating practices is reported, for to identify such a case except in general terms would permit identification of the person responsible for the infraction, a violation of the System's basic charter. It should be noted, however, that reports of such singular problems are by no means useless. Several system problems have been identified in the process of evaluating such reports. Some of these have been described in alert bulletins (appendix A, bulletins 6 and 7); others will be discussed in systematic studies to be conducted after ASRS data are available in a computer database. Table 18 is a cumulative summary of FAA and other responses to alert bulletins.

TABLE 18.– NASA ASRS ALERT BULLETINS

Alert bulletins submitted through October 14, 1976:		189
Submitted for information only	4	
No response received to date	44	48
Responses received through November 8, 1976		141
Content of 141 responses:		
Information insufficient to permit investigation of problem	8	
Information in bulletin apparently was incorrect or incomplete	10	
After study, no system problem was found – no action required	25	43 (31%)
Alert bulletin information is under investigation	11	
Investigation is complete; action on the problem is not within FAA purview	2	13 (9%)
Action to resolve the problem was in progress when bulletin received	23	
Action has been or will be initiated to resolve the problem	62	85 (60%)
		141 (100%)

DISCUSSION

ASRS report volume has remained relatively constant for 26 weeks (fig. 4). The initial peak was due largely to reports of occurrences prior to the beginning of ASRS operations. A second increase occurred immediately after wide dissemination of posters and pamphlets containing report forms; it likewise was short-lived and system volume has returned to an average of 100 reports per week. Figure 4 includes some data from the current quarter to make this clear.

Within that constant intake rate, however, there have been changes in the contributions from the various segments of the aviation community. Reports of general aviation occurrences have declined; those of air carrier occurrences have increased. Controller reports now comprise half, rather than one-third, of the total volume. Though a further decline in general aviation activity, and particularly pleasure flying, may be expected with the onset of winter, further promotional and educational efforts should be directed at this very important segment of the aviation community.

The second quarter of ASRS operations has been a period of intense activity with regard to the structuring of the data for entry into a computer database. Several weeks of planning and conferences preceded final decisions as to database architecture on September 20, 1976. These activities have detracted somewhat from system productivity during this quarter, but they were critical if the system is to be fully productive later.

The architecture of the database is comparatively straightforward; a detailed description will be presented in a forthcoming report. Briefly, an extensive file of fixed fields data describes the attributes of each report. Numerical and coded information, keywords, and lists of enabling factors are provided to facilitate searches for specific categories of data. The fixed field information is

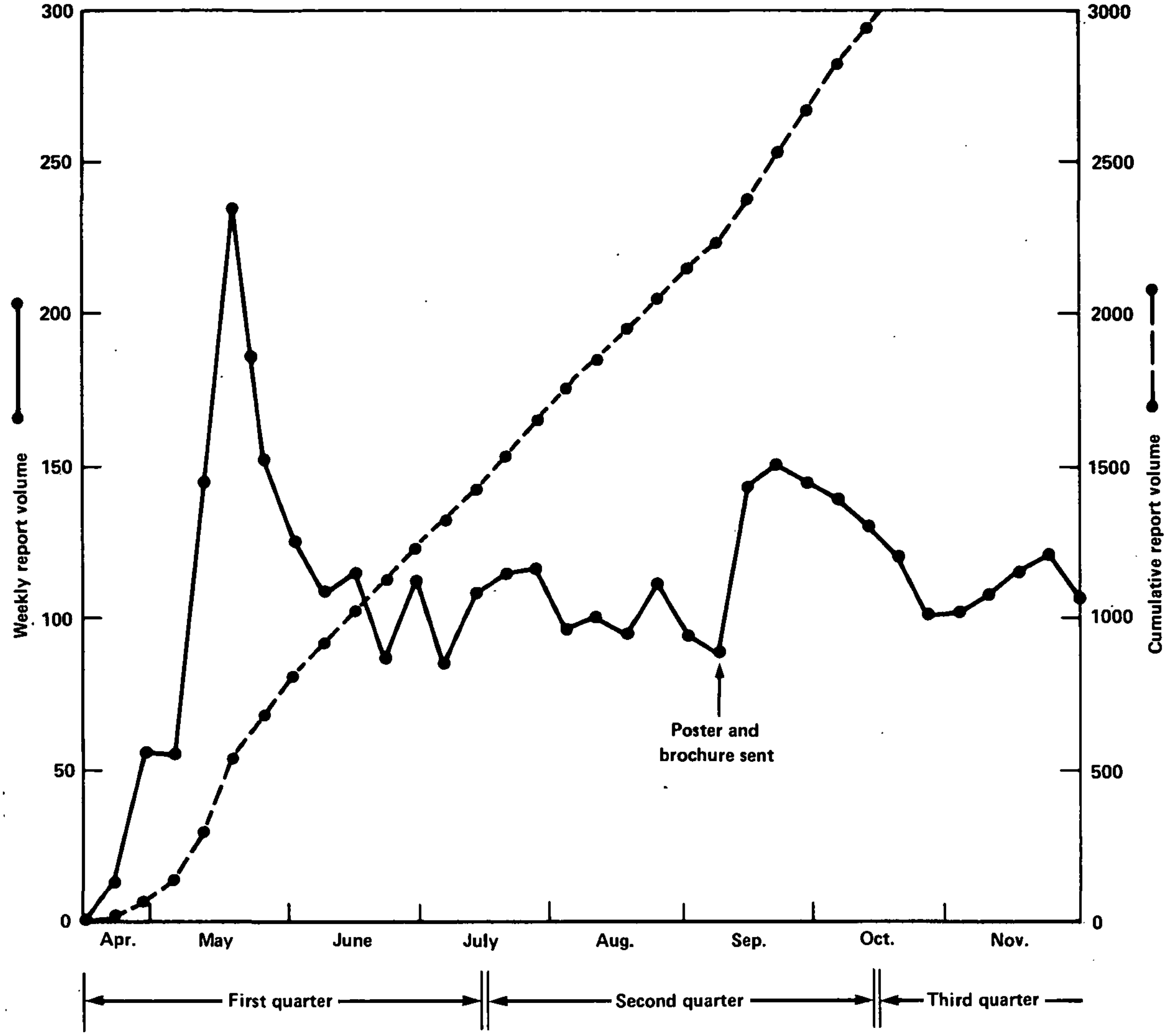


Figure 4.– Report volume by weeks.

complemented by a free text file that contains a synopsis of the report, an edited narrative, and comments by ASRS analysts.

Present schedules call for all second quarter data and as much third quarter data as possible to be available for automated data processing by the end of the third quarter on January 15, 1977. The variety and complexity of analyses that can be performed will increase substantially after that time. Figure 5 shows near-term ASRS milestones.

This quarter has also been a period of examination of the basic methodology implicit in the ASRS concept as it was presented to the aviation community. Certain methodological deficiencies have become apparent; some are inherent to the concept, others can be removed by changes in methods of operation.

Foremost among the conceptual deficiencies is the present inability of the system to verify or refute the existence of a specific problem prior to submission of an Alert Bulletin to the FAA and

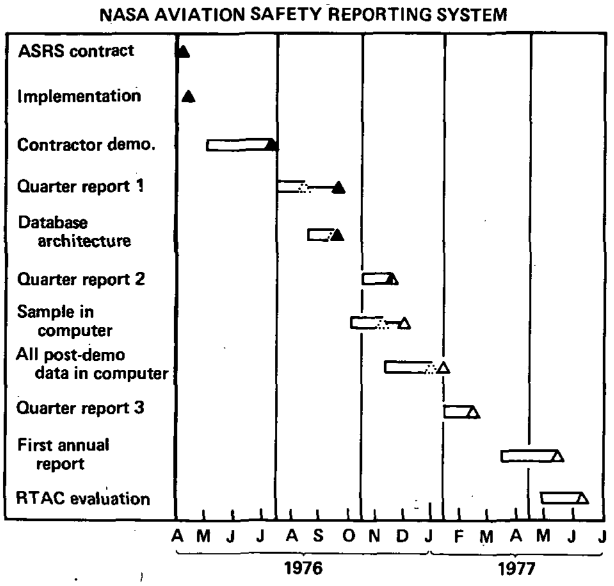


Figure 5.– Milestone schedule.

the community. While the ASRS does not attempt to investigate specific occurrences, it would be extremely helpful to be able to contact knowledgeable persons concerning the presence of specific enabling factors in the system prior to disseminating information about them. The dissemination of inaccurate information diminishes the credibility of the System, but it cannot be avoided under the present rules if incorrect data are submitted in ASRS reports. (See appendix A, bulletins 8, 9, and 23 for examples.) Methodological deficiencies involve largely the flow of paperwork within the system; these are being corrected as they become apparent.

Many ASRS reports are of considerable interest from an educational viewpoint, whether or not they present information regarding a specific safety hazard. Several are included in appendix B; if such reports appear to be useful to the community, this method of presentation will be continued and such reports will be flagged on a continuing basis. In this regard, the managers of the ASRS solicit, and will be responsive to, comments from readers of these reports as to how quarterly reports can be structured to be most useful to them. Such comments should be directed to:

Charles E. Billings, M.D., Chief
Aviation Safety Research Office, 239-3
Ames Research Center, NASA
Moffett Field, California 94035

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, California 94035, December 21, 1976

APPENDIX A

EXAMPLES OF ALERT BULLETINS AND RESPONSES

INDEX

The first ASRS Quarterly Report contained a sample of Alert Bulletins generated on the basis of reports submitted to the ASRS. Several more bulletins are reproduced here, together with responses by the FAA and others in the aviation community. Many of these alert bulletins illustrate specific points in the text of this report.

1. On the first day of ASRS operations, several reports were received by the Washington office of the FAA's Aviation Safety Reporting Program. The reports cited several examples of deficient advance coordination concerning handoffs from San Juan Center to St. Thomas Air Traffic Control Tower. The reports cited the Letter of Agreement between the two facilities. The substance of the reports was relayed to air traffic authorities by Mr. Youngren, the FAA ASRP manager. Many similar reports were received by the ASRS during subsequent weeks. Further conferences with Air Traffic service led to a study of the matter and the institution of corrective measures, including those described in the written response reproduced here.

Text of Response: A thorough investigation was made by San Juan ARTC Center of ASR reports of incidents in the vicinity of St. Thomas, U.S. Virgin Islands. Details of the seven incidents are itemized below: . . .

. . . A summary of the seven incidents reveals that with the exception of XY 773 (where apparent error was on the part of the pilot), all the incidents are attributable to a breakdown in coordination between San Juan Center and St. Thomas Tower. In two instances no inbound information was passed, while in the four others, only partial information was coordinated, and it was coordinated later than should have been.

As mitigating (though not exonerating) circumstances for the five ASR reports on April 15, the peak traffic recorded this year occurred then. Also, the San Juan controllers at the radar and manual positions serving the St. Thomas area were swamped with VFR pop-ups requesting IFR clearances due to deterioration of the weather. . .

. . . As a result of these incidents, all San Juan ATCS's are being rebriefed on the San Juan Center/St. Thomas Tower Letter of Agreement, particularly as it deals with coordination procedures. Mr. William H. Davidson, Chief, St. Thomas ATCS, and one of his controllers will assist in the briefing to emphasize their special problems.

Text of memo to San Juan Center supervisors:

We are still experiencing problems with the required coordination and transfer of communications between San Juan Center and St. Thomas Tower. These problems are related to arriving aircraft. As a result, Aviation Safety Reports have been filed and numerous complaints have been received. An investigation of these reports and complaints show that we have been at fault in the majority of the incidents.

As an interim measure, all personnel shall be briefed on the San Juan Center/St. Thomas Tower Letter of Agreement immediately. Floor supervisors shall concentrate their attention, as much as possible, on Sector 3 and monitor the handling of arriving aircraft at St. Thomas Airport. Until further advised, all complaints related to this problem will be investigated by the assistant

chief on duty. A complete report with all details and corrective action taken shall be forwarded to the facility chief within 24 hours of occurrence.

For your information a detailed report of previous incidents involving ASR's had to be made to ASO-500. This report included actions that will take place in the near future to resolve the problem. They are:

a. A visit to St. Thomas Tower by San Juan Center to receive an on-site briefing and discuss possible procedures to solve the "pop-up" traffic problem.

b. On return from this visit, a briefing package for all personnel on coordination and transfer of communications with St. Thomas Tower will be developed.

c. A briefing by Mr. William H. Davidson, Chief, St. Thomas Tower, for all Center personnel to provide additional insight on the importance of close mutual support between the two facilities, and the peculiar problems caused by the mixture of IFR/VFR traffic.

2. Text of AB: Iliamna, AK: Prior to establishment of two landing strips within 0.5 miles and an approved apt within 4 miles, pilots used to land on 40 ft wide gravel street in front of post office. Some are still doing this despite auto, bicycle and pedestrian traffic on street. Residents of Iliamna believe this is dangerous to children and others and should be stopped. Most recent incident occurred only a few days ago. They request any help FAA can provide.

Iliamna, AK: Additional reports of acft using road in front of post office as landing strip, despite pedestrian and vehicular traffic. Residents of town plead for assistance in ameliorating this hazard.

Text of Response: This activity is usually commonplace in most remote areas as a road in some instances serves as a runway and has been used this way for years.

Alaska State legislature proposed a HB #354 during this year's session to prohibit this practice of landing on roads, but it died in Committee.

Alaska State Statute #2 states in part it is considered a careless and reckless operation should an incident or accident occur while conducting a landing or takeoff from any road in Alaska.

FAR 91.9 does, however, cover such acts if they are shown to be endangering the life or property of another and enforcement action will be taken, if appropriate.

This matter will be given emphasis by the Alaskan Region, in their accident prevention program. In addition, they shall dispatch an inspector periodically to determine the effectiveness of these actions.

3. Text of AB: Santa Maria Apt, CA, and Vandenberg Apch Control: Several reports indicate a coordination problem involving departures and rwy 12 ILS approaches. SOP calls for VBG Apch Ctl to issue releases for departing IFR acft from Santa Maria. On two recent occasions, Santa Maria

has released acft on rwy 30 per release times from VBG, and has found that acft were over FAF on apch to rwy 12. One occurrence required an evasive maneuver under VFR conditions; in the other, Twr was able to stop departing acft on rwy.

Also, reports indicate that when Santa Maria Twr is shut down and VBG is controlling all traffic, departure clearances are issued for left turn direct to VBG VOR. Reporters point out that fully loaded reciprocating engine acft may find it difficult to maintain legal terrain clearance over a 1645 ft hill 4–5 miles west of the airport.

Text of Response: ASRS identifies alleged coordination and control problems in very general terms, i.e., call signs and dates are not given. This lack of information makes investigation difficult. Nevertheless, the appropriate Communications Group looked into alleged problems and has furnished us with the following information:

a. Opposite direction traffic:

i. Opposite direction departures are forbidden at Santa Maria Airport whenever an arriving aircraft reports procedure turn, Willow, Solomon, or Oak intersections. If a departure has been released, its release is cancelled.

ii. On one occasion, Vandenberg RAPCON personnel recalls an aircraft making a late report of his procedure turn after another had been released for an opposite direction takeoff. The controller responsible for the release was slow in reacting to the situation which resulted in VFR maneuvering by the departing aircraft to maintain separation.

iii. The controller involved in this situation was given additional training in the assistant controller position. In addition, all controllers training for the assistant control position now receive special classroom training on Santa Maria procedures.

b. Departure procedures for terrain clearance:

i. No specific instances can be identified regarding left turns direct to the Vandenberg VOR. The standard procedure "Runway heading until 800 ft MSL" is adequate and has been reemphasized to RAPCON controllers though proficiency training.

ii. During periods when Santa Maria is open, the Letter of Agreement stipulates that the Santa Maria controllers shall issue the standard departure procedures. This responsibility has been reemphasized to the Santa Maria tower chief.

iii. Additionally, a new Standard Instrument Procedure (SID) is being developed which will allow more expeditious traffic movement than the current procedure allows. Terminal Instrument Approach Procedures (TERPS) will be considered in the development of the SID.

Both of these areas of concern were discussed with the Comm Gp personnel during the Strategic Communications Area ATC Analysis Visit of 9–13 Aug. 1976. The Vandenberg RAPCON controllers are acutely aware of the peculiar traffic situation at Santa Maria Airport – frequent opposite direction traffic and terrain avoidance on the departure route. RAPCON management identified these areas for continuous training.

4. Text of AB: Several locations: Several reports received from controllers and pilots suggest possible misunderstanding of the rules and procedures governing the use of airspace blocks outside restricted airspace made available for military refueling and other special operations. Such airspace, governed by MARSA[2] concept, is used by civil traffic under ATC control, but ATC personnel may be unaware of intent of military traffic while civil traffic is transiting the blocked airspace. Two recent occurrences have involved AR-100, though other blocks have been cited also. It appears that military pilots believe the space is actually blocked for their exclusive use during a period of time, but that ATC feels free to use the space, or a portion of it, provided radar separation is maintained. This has led to conflicts because military pilots did something other than what ATC expected them to do.

Text of Response (from USAF): This letter was originally issued in response to an earlier hazard report. A copy was sent to ASRS because of its relevance to the cited problem.

After considerable coordination and numerous phone calls across the country, we have finally been able to resolve this problem. The crux of the problem was a misunderstanding between ARTCC and the aircrews as to when MARSA was in effect. As a result of this hazard report and another mishap that SAC/DOSF brought to the attention of FAA personnel, the procedures for MARSA are being revised. These procedures are:

a. MARSA begins:

i. When the tanker advises air traffic control that he has voice contact with the receiver *and* he is accepting MARSA.

ii. When air traffic control receives approval from the tanker to allow the receiver to enter previously assigned refueling airspace.

b. MARSA ends:

i. When approved separation standards are established in the airspace *and* air traffic control is advised.

ii. Air traffic control advises that MARSA is terminated.

c. If safety reasons dictate, air traffic control may terminate MARSA. If this condition occurs, MARSA cannot be reestablished unless concurrence is obtained from both air traffic control and the tanker/receiver.

The intent of the above proposed changes is that MARSA will not begin or end without a definite statement from the parties involved. These procedures are presently in coordination at FAA and USAF Headquarters level and will be in effect later this year.

These changes have been discussed with SAC/DOSF and they agree with us that they are adequate corrective actions. For that reason, both MAC and SAC consider this hazard report closed.

[2] MARSA: Military accepts responsibility for separation between aircraft.

5. Text of AB: Pittsfield, IL: Pittsfield Penstone Muni Apt: report describes two low altitude tng routes within 15 mi of apt. Routes are supposed to be used at altitudes of 500–1500 ft AGL. Reporter describes jet tfc on the routes as low as 100 ft AGL, sometimes straying 8–10 mi from published routes. Reporter also describes "repeated passes across the Pittsfield Apt or within 1/2 mi of the apt."

Text of Response: This Alert Bulletin was researched and the following facts were disclosed:

- TR 626 extends from southwest to northeast, the centerline passing within six statute miles of the Penstone Municipal Airport.
- TR 725 extends from southeast to northwest and terminates eleven statute miles southeast of the Penstone Municipal Airport. This route should not be a factor in this Alert Bulletin.
- Both routes fall within the purview of and comply with the provisions contained in Handbook 7610.4C, paragraph 1521.
- There are no requirements for aircraft to maintain altitudes at or above 500 AGL. Altitudes below 500 AGL are possible and still comply with FAR 91.79.

The problem appears to be operational. The only unit using this route at present is the XXX Tactical Fighter Group (ANG). The Regional Air Force representative was contacted and told of this Alert Bulletin. He advised that he would contact the above named unit and have the Penstone Municipal Airport posted as an "Area to be Avoided." All pilots in the squadron will be briefed and advised to fly the centerline or north perimeter of route TR 626.

6. Text of AB: College Station, TX, Easterwood Apt: Pilot reports having difficulty locating Easterwood Apt at night and lining up to land at Coulter Field, 5 miles NE, after receiving landing clearance from Easterwood Twr. He states confusion occurred because Coulter rotating beacon was on, Easterwood beacon was off. After landing, he was told that Easterwood beacon, on top of old control tower, blinds controllers in new tower cab, so controllers turn beacon off when tower is in operation.

Text of Response: The rotating beacon is turned off, and a NOTAM (L) is issued, during the hours of darkness when the tower is in operation for safety purposes. The flashes of light from the beacon make it almost impossible to see aircraft. Action has been taken to relocate the beacon atop the hangar adjacent to the old tower structure. Upon relocation, which is scheduled in the near future, the beacon will be shielded to prevent the light from interfering with controller duties.

The above action should resolve the problem.

7. Text of AB: St. Charles and Aurora, IL: DuPage County and Aurora Apts, Chicago Sectional Chart: Information regarding DuPage VOR is printed inside Aurora Apt control zone. DuPage Apt Information is just above this, leading to frequent mistakes by transient pilots who land at Aurora Apt while in communication with DuPage Twr. Reporter requests that DuPage VOR data

be placed where DuPage Apt info is, and that DuPage Apt info be located between Elgin intxn and Wayne Apt. Subsequent pilot report verifies the problem; pilot landed at DuPage without contacting Twr, due to difficulty in interpreting chart while trying to avoid severe weather.

Text of Response: The National Ocean Survey (NOS) has been notified of this confusing situation and they have advised that it will be corrected in later issue of the Chicago Sectional (fig. 6).

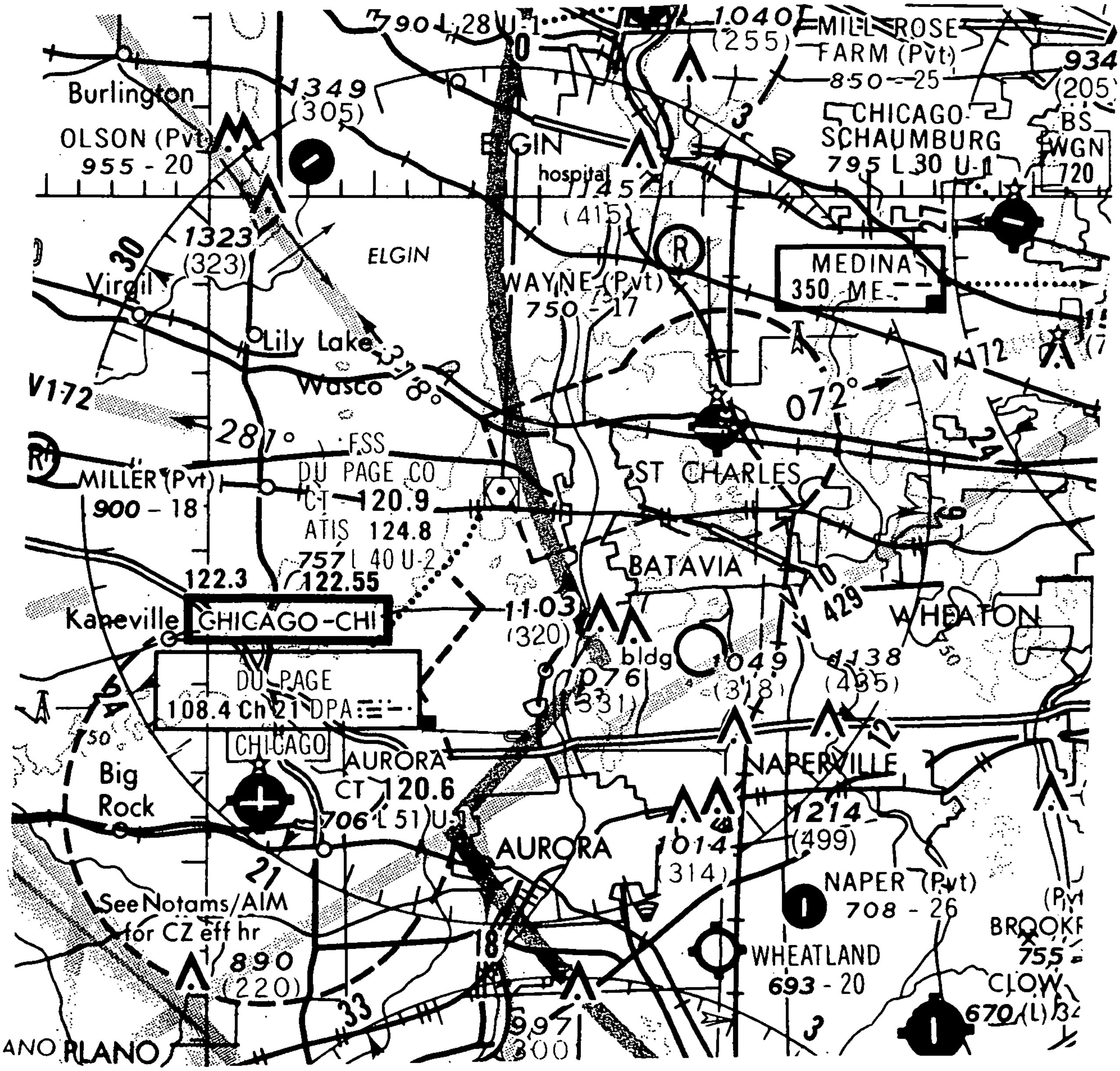


Figure 6.– Chicago sectional chart.

8. Text of AB: Athens, Georgia: Part-time tower recently activated, not shown yet on VFR charts. Pilot suggests Unicom rcvr in twr during transition period so controllers will be aware of incoming traffic which has not become aware of tower.

Text of Response: Investigation of this report revealed the Air Traffic Control Tower at Athens, Georgia, was commissioned on July 21, 1973.

The current sectional chart for the Atlanta Area depicts the airport at Athens and indicates an operating Control Tower with the frequency 126.3 MHz. Part 3 of the Airman's Information Manual also lists a Tower at Athens Municipal Airport. Local and ground control frequencies are listed. The hours of operation are also listed.

We do not feel a UNICOM receiver is necessary or appropriate under the circumstances.

9. Text of AB: Illini Apt, Urbana, Illinois: Traffic landing on or taking off on rwy 10 (paved) cannot be seen from departure end of grass rwy 4. At least one collision and one near midair have occurred in past year at IXN of runways. Cause of obstruction to vision is grove of trees between runway departure ends.

Text of Response: A check with the Illinois Department of Aeronautics reveals that visibility between the ends of Runway 10 and Runway 4 is unlimited. However, at a point down Runway 4 and at a point down Runway 10 there is about 300 to 400 feet on each runway where visibility of the other runway is restricted by a house and a grove of trees which are located on public property. Neither the state nor the FAA are aware of the alleged collision or of the near midair mentioned in the report. Any information on these events would be appreciated.

Alert bulletins in several of the problem code areas are presented below. Several of these could be coded under either of two codes; brief comments are appended where necessary.

Reports 10–13 deal primarily with air traffic control coordination and procedures.

10. Text of AB: Pilot using ORD reports that approach controllers are not always aware of the ILS configurations set up by Tower, or of ILS status. In one case, LOC was set on 4L with parallel approaches in progress to 22L and 22R. Pilot expected normal sensing, overshot centerline because of reverse sensing, had to locate 4L apch plate to verify identifier (frequency is the same). In another case pilot was instructed to track inbound on LOC which was off the air after a late switch from rwys 27 to rwy 22. He requests that apch controllers be kept aware of tower-initiated changes in navaid configuration.

Text of AB: Two additional reports are received (see also ASRS AB76-3) in which ATIS and local control cleared acft for an approach while ILS LOC was oriented in opposite direction on same rwy. In both cases workload was high; identification was checked comparatively late and found to be wrong. Airports concerned are Robert Mueller, Austin, TX, rwy 12R-30L (109.5) and LGA rwy 4-22 (110.5). VOR-C apchs to 22 were in use in latter case; ILS frequency was used for

vertical guidance. Erroneous indications alerted both pilots. In both cases, Apch Control was unaware of ILS configuration.

Text of AB: Another instance of ILS configuration confusion has been reported. This involved Detroit. DTW ATIS specified rwy 21R as active. A flight was vectored to final apch course for rwy 3L, found ILS ident to be incorrect, checked with twr and ILS was switched to 3L configuration. The pilot points out that in this case, the two identifiers are very similar: I-DWC and I-DTW, adding to the potential for a misidentification. Two previous alert bulletins have referred to confusion between twr and apch control regarding ILS configuration.

Text of Response: We have investigated these ILS switching problems and found the applicable procedures in each case to be effective when properly applied. However, we recognize the possibility of a serious incident if these procedures are not properly applied. We are requesting all regional Air Traffic Division Chiefs to emphasize the importance of adhering to proper procedures during ILS switching.

Air traffic controllers may begin vectors to an ILS which is not currently in use when a change in landing direction is in progress. In an effort to reduce holding and provide better service to the user an aircraft may be positioned by radar in the final ILS approach area prior to that system being selected for use. However, approach clearance may not be issued until the appropriate ILS has been selected for use. This situation would occur when there are aircraft in the process of completing the approach previously in use.

Aircraft making the LaGuardia VOR-C approach should not use the ILS 22 equipment for vertical guidance. It is possible that the instrument landing system for 22 at LaGuardia is not available when VOR-C approaches are in use. Normally we prefer to use precision approaches, such as ILS, when they are available.

11. Text of AB: New Orleans International Airport, LA: Report cites several incidents which have occurred because New Orleans TRACON was not fully informed regarding whether rwy 10 or rwy 28 localizer was active. Colored lights are used to indicate current configuration at the local control position, and reporter suggests that repeater lights installed in TRACON would eliminate future confusion.

Text of Response: At present, the controller-in-charge (CIC) at Moisant Tower has the responsibility of notifying the TRACON of which localizer is in use.

Soon after the second localizer was commissioned, the facility identified a need for a localizer monitor panel to be located in the TRACON. On September 6, 1976, the local Airway Facilities Sector advised that a monitor panel had been fabricated and would be installed in the new TRACON, which will become operational November 1, 1976. In the interim, special emphasis will be placed on executing timely and proper coordination between the tower cab and the TRACON when a runway and localizer change is made.

This action should eliminate any future confusion in reference to which localizer is in use.

12. Text of AB: Fresno, CA, Fresno Air Terminal: Pilot reports that Fresno Apch Control handles some VFR landing traffic throughout landing sequence and rollout after landing, while other traffic in pattern for landing is being handled by local control on another frequency. He questions whether coordination in event of an emergency would be adequate or rapid enough in this dual control situation. This mode of handling traffic has apparently been in effect since FAT ATCT acquired stage III capability.

Text of Response: Fresno Approach Control provides Stage II Radar service to aircraft arriving and departing the Fresno Air Terminal. All radar positions are located in the tower cab utilizing BRITE displays and the Stage II Controller is located immediately adjacent to the Local Controller. Under normal circumstances, once the aircraft receives pertinent information and is sequenced by approach control, it is changed to the Local Control frequency for landing clearance. During extremely light traffic conditions, the Local Control position and the Stage II Radar position are sometimes combined and aircraft are occasionally issued landing clearance without having to change frequencies.

13. Text of AB: Martin Field, Akron, Ohio: Parachute jump zone. High level of jumping activity within seven miles of CAK in an established parachute drop zone (published in AIM) reportedly causing serious ATC difficulties, especially during marginal VFR operations. Radio contact with CAK approach is reportedly done intermittently, and reporter suggests that such contact should be both mandatory and enforced. Given the present situation, Akron-Canton radar cannot properly advise IFR and Stage III traffic regarding parachute jumping activity.

Text of Response: Research and conversations with the Facility Chief of the Akron-Canton Air Traffic Control Tower reveal no evident problems from parachute jumping in the subject area.

This parachute jumping is conducted in controlled airspace (TRSA) and two way radio communication is in fact mandatory. FAR 105 outlines all procedures to follow in relation to jumping and the Facility Chief assures that all existing regulations are enforced.

As follow-up, the facility will investigate this situation to uncover any difficulties that may not have surfaced prior to this time.

Reports of pilot deviations or flight crew errors may reveal system problems that prompt the issuance of an alert bulletin (examples include numbers 2, 6, 7, and 18 in this appendix). Such errors in themselves, however, rarely warrant special handling. Likewise, potential conflicts between aircraft usually do not result in alert bulletins, though system problems alluded to in these reports may result in an alert bulletin (numbers 3, 4, 5, 17).

Problems related to ground-based navigation and communications aids are not infrequently reported to the ASRS. In such cases, an attempt is made to discover whether the problem is a random one, or whether the problem has been present consistently. Bulletins 14 and 15, which describe such problems in a nonradar facility, are discussed below.

14. Text of AB: Reading, PA, Reading Apt ILS rwy 36 LOM: Several reports state that inbound IFR acft have considerable difficulty locating and tracking to the LOM. Controllers often use DF to check on location of inbounds; several have been located at FAF altitude north of apt, headed toward high ground. Reading is a nonradar facility. The majority of these problems appear to occur during precipitation. Reports state that LOM has not been flight-checked under these conditions. In all, over 40 occurrences of problems with LOM and LOC course are cited in these reports.

Text of First Response: The problems concerning the Reading, Pennsylvania, LOM facility serving Runway 36 do not stem from any inadequacy of the ground facility.

On June 4, 1976, this facility was flight inspected with a Jet Commander per new FAA flight inspection criteria and no problems were encountered.

As suggested in the NASA-FAA dispatch attached to the subject letter, we have arranged with the Atlantic City, New Jersey, Flight Inspection Field Office to have the RD LOM flight checked during heavy precipitation as soon as possible to determine if this is a contributing factor.

Since June 1973 when we were first apprised of aircraft receiver difficulties with the RD LOM, the following actions have been taken:

a. In July 1973, a waterproof insulator was installed in the equipment building to prevent the transmitter RF signal from short-circuiting to ground in wet weather.

b. In January 1974, the standard 20-foot high Delta antenna was replaced with a standard 40-foot high Squirrel Cage antenna to improve the range of the facility. This antenna was modified with plastic rainshield cups on the upper end of the eight vertical insulators to make the facility absolutely stable in wet weather. At this facility, the antenna current meter needle does not move at all during heavy precipitation.

c. In May 1974, the RT LOM for Runway 31R at J. F. Kennedy International Airport operating on 268 KHz was reduced in power from 25 watts to 10 watts to eliminate the 1000 Hz audio beat-note interference with the RD LOM on 269 KHz in the Reading, Pennsylvania, area.

d. In February 1975, the RD LOM frequency was changed from 269 KHz to 356 KHz.

Both before and after these improvements, the Reading LOM has consistently passed flight inspection. This indicates to us that the technical condition of the LOM is satisfactory and that the problem may be related to the use of this facility beyond the service area protection of 15 nautical miles.

We also suspect that some of the jet aircraft difficulties with the RD LOM may be related to airborne receiver design and sensitivity.

AAF-400 is aware of this receiver problem and has had discussions with the manufacturer with the hope of improving the coverage of these receivers. We have been advised that Flight Standards plans to test a modification developed by the manufacturer that may increase the receiver range.

We will advise you of the results of the special flight inspection performed in heavy precipitation as soon as the results are known.

Text of the Second Response: In response to a suggestion in the NASA-FAA priority message attached to the subject letter, we have had the Reading, Pennsylvania, LOM serving Runway 36 flight checked during inclement weather to determine if this is a contributing factor in the traffic problems at Reading.

This flight inspection checked out a proposal to utilize the Shoemaker intersection, some six miles closer to the RD LOM than the presently authorized Hamburg intersection.

The flight check data showed an improvement in service during precipitation conditions.

Action will be initiated to implement a procedure predicated on the Shoemaker intersection, and the existing procedure using Hamburg will be cancelled.

15. Text of AB: ATCT Reading, PA. Several reports indicate that lack of FDEP equipment at Reading ATCT is causing serious coordination problems with surrounding ATC facilities. IFR aircraft often report to Reading approach control within a short distance of the aircraft's assigned clearance limit, and without any prior information from the previous ATC facility. Controllers at surrounding facilities apparently assume that Reading has FDEP, and that entry of the message into the normal communications channel is sufficient to effect coordination.

Text of Response: FDEP printers are procured through the budgetary process. The criteria set forth by Headquarters is as follows:

Primary Airport – 30,000 or more instrument operations

Satellite Airport – 20,000 or more instrument operations

Reading Approach Control – instrument operations for CY-75 was 23,216, and therefore does not qualify for FDEP.

The New York Center, Philadelphia, Harrisburg, and Allentown Approach Controls will issue directives emphasizing coordination requirements.

Additionally, the Chief, Reading Tower has taken action to prevent a recurrence.

Several airport problems were presented in a previous report. Three others, of widely differing types, are described here. In the first, a response was received very promptly from a local official. The others were investigated by FAA authorities.

16. Text of AB: Pottsville, PA, Schuylkill County Apt: Reporter states that he has observed automobiles driving on active runway on four occasions during night hours, when apt is unattended.

Text of Response: Our airport is unattended after dark. It is periodically checked by us and the police. When we close at night we do drive out and check the lights. If we had an approximate time we could check it out closer. There also are occasions when we know of an aircraft close inbound, we check for deer on the runway.

17. Text of AB: Ellington Apt., Connecticut: Rotary wing training opns at sides of rwy 19 interfere with fixed wing operations on that rwy. This is apparently a continuing problem.

Text of Response: A special airport surveillance was conducted during the weekend of June 26 to determine the degree of problems between Ellington's fixed- and rotary-wing aircraft.

The airport has one hard surface (2000 ft north/south runway) with a hard surface taxiway to the east that parallels the entire runway. Rotary-wing aircraft operate east and parallel to the taxiway in a grass area well clear of the runway.

In addition, the fixed- and rotary-wing aircraft operate different traffic patterns; e.g., fixed-wing aircraft operate west of the runway while rotary-wing aircraft operate east of the taxiway. Additionally, the airport's traffic pattern altitudes are 1250 AGL for fixed-wing and 900 AGL for rotary-wing.

There is one helicopter based at Ellington and it is used for training. The reporting inspector stated that rotary-wing training is not conducted at Ellington; only the initial takeoff and return to base is accomplished. Touch-and-go landings and other training are conducted at an adjacent field well clear of Ellington.

During the airport inspection, it was noted that diagrams of the traffic patterns were not available at the airport. The inspector recommended to the airport manager that diagrams of each pattern be prepared and posted at various locations. Lastly, neither the inspector nor the personnel interviewed reported any traffic problems between the various aircraft.

18. Text of AB: Amarillo, TX, Amarillo Air Terminal: Reports indicate Rwy 3-21 runway lights intermittent or inoperative during and after heavy rain, accompanied on recent occasions by intermittent operation of localizer and LOM. RVR is also affected. This has resulted in diversions and cancellations.

Text of Response: We have investigated the problems reported in the subject Air Safety Bulletin and have the following to report.

The intermittent or inoperative performance of the Runway 3-21 runway lights during and after a heavy rain was attributed to faulty cable and on the 29th of October the airport sponsor, in the process of replacing them, installed temporary lighting. The temporary lights had cables running along the surface. The ATC Chief issued a Notam advising of these temporary lights and indicating that displacement of the threshold was also necessary. ATDO-33 noted the situation and issued a Notam shutting down the runway which resulted in diversions and air carrier cancellations.

The RVR was affected because its calibration was derived from the runway lights and when these lights became inoperative the air traffic Chief Notamed the RVR out of service.

The report of the localizer (LOC) and outer locator (LOM) being intermittent on occasion was not related to the above. The problem was exhibited as intermittent sounding of the alarm buzzer in the tower panel but not resulting from failure of the LOC and LOM. No outages occurred and no diversions or cancellations resulted. It was corrected almost immediately by local maintenance.

It is our understanding that all corrective actions have been completed at the Amarillo Air Terminal and service has been fully restored.

Comparatively few problems involving aircraft or aircraft systems have been reported to the ASRS; two that did result in alert bulletins are reproduced here.

19. Text of AB: Aircraft manual for a 1964 and 1965 model single engine aircraft does not state that ram air gate should be closed if operating in visible moisture (rain, snow) to prevent ice formation in fuel servo and subsequent engine failure.

Text of Response: There is no requirement that this data be included in the FAA-approved flight manual for the aircraft as long as it is presented by appropriate markings, placards, or any combination of these. However, the operator's manual contains instructions for the use of ram air.

20. Text of AB: An ELT beacon became dislodged from mount in rear fuselage of a 1973 model light aircraft during flight in moderate turbulence. It actuated when it fell to bottom of fuselage and also partially jammed control cables. We are told that report was furnished to FAA by mechanic.

Text of Response: We are aware of some emergency locator transmitter (ELT) installation problems. We propose to improve the situation by revising our ELT advisory circular to further emphasize the proper installation techniques.

Problems involving procedures, regulations, and publications are a small part of ASRS volume, but such reports result in alert bulletins in a substantial number of cases. Bulletin No. 21 resulted from a pilot's carefully researched report which went into detail on the history of the issue described. Bulletin No. 22 discusses a complex approach procedure on which corrective action may have been under way prior to submission of an alert bulletin. Bulletin No. 23 describes a charting problem (see also No. 7, above). It will be noted that the information submitted to the ASRS and disseminated in this bulletin is partially incorrect, though the chart problem does exist. The bulletin was based on a report from a pilot who became confused while trying to reach one of the two airports at night by using the beacon of the other as a reference.

21. Text of AB: Long Island, NY, Satellite Airport area: Colts Neck Two SID was established some time ago to eliminate the necessity of extended overwater flight for single engine IFR acft

going southwest from Long Island. On return flights, however, pilots are usually vectored via 080 radial of ACY to intercept V-139, to DPK 209 radial to SELFF intxn. This routing involves flight more than 40 miles from shoreline. Pilot asks whether an IFR standard arrival procedure can be devised which will allow single engine aircraft to avoid extended over-water flight when returning from southwest to Long Island.

Text of Response: The routing described in the report is not the standard arrival route to Long Island airports from the southwest. The usual route is via V44 SATES, V44 Deer Park, radar vectors to destination. This involves only limited flight over water and avoids arrival/departure routes for Kennedy and LaGuardia Airports.

When traffic at the major metropolitan airports is light, Long Island arrivals are radar vectored from SATES towards Kennedy VORTAC further minimizing flight time over water. Use of this route or a similar overland route as a standard procedure is not practical because of its impact on the major metropolitan airport flow.

The routing referred to in the report is used occasionally when there are extensive delays to Kennedy Airport and the SATES holding pattern is at capacity. While it is realized that this route may be undesirable for single engine aircraft, the only alternative during delay periods, is a lengthy hold south of SATES. Pilots preferring delay to extensive over-water routing should advise the controller of this fact so that he can take alternate action.

22. Text of AB: Reading, PA, IFR approach procedures, Rwy 36: Several controllers report numerous instances of pilot deviations during IFR operation due to complexity of initial approach procedure. Inbound routing is via V-39 and V-162S to Boyer (IAF). Traffic is then routed via V-170, join LRP R-082 to join Reading LOC. Procedure involves 95 degree right turn, 67 degree left turn, and another 81 degree left turn, all while traversing a total distance of less than 10 miles, and usually further complicated by simultaneous descents.

Text of Response: The problem stated above occurs when New York ATC Center traffic above 5000 ft is cleared to Boyer intersection for handoff to Reading Approach Control. Air traffic that arrived over Boyer intersection was required to follow the complex routing as stated above. Inbound traffic on V-39 and V-162S proceeding to Reading, PA, airport are normally routed below 5000 ft via the published transitions from Lancaster VORTAC and Fleetwood intersection prior to reaching Boyer intersection. The problem has since been relieved by establishing a new transition direct from Boyer intersection to the Reading NDB/Outer Marker (LOM). An amended procedure with the new transition became effective August 12, 1976.

23. Text of AB: Indianapolis, IN, Brookside and Metropolitan Apts: Report indicates that current sectional chart shows Metropolitan Apt with rotating beacon, Brookside without one, though both apts have rwy lights. He states that in fact, Brookside Apt has a rotating beacon; Metropolitan does not.

Text of Response: Phone conversation between National Flight Data Center and airport personnel indicates both Brookside and Metropolitan Airports at Indianapolis, Indiana have operating clear and green rotating beacons. Appropriate charting agencies will be notified of the correct status of these beacons via the National Flight Data Digest (NFDD).

APPENDIX B

EXAMPLES OF AVIATION SAFETY REPORTS

INDEX

Several of the reports that are presented here illustrate points made in the body of this quarterly report. Others are included because they describe problems most amenable to correction by individual awareness of the procedures that should be used or the regulations that apply. It is hoped that such reports will be useful to the FAA and to organizations in the aviation community in their continuing efforts to improve safety awareness within the aviation community.

Report No. 1, regarding a light airplane accident, was required to be transmitted in identified form to the FAA and the National Transportation Safety Board under the terms of the Memorandum of Agreement which governs the ASRS. It is presented here because of a safety problem that became evident only when the occurrence was discussed with the reporter. Report No. 2 is an example of an occurrence whose dynamics became clear only during further discussions with one of the reporters.

1. Submitted by air traffic controller:

The aircraft, a low-wing single-engine two seat trainer, crashed shortly after takeoff. Apparently the student pilot did not switch to a full fuel tank prior to takeoff. The crash happened while the pilot was trying to return to the airport.

My personal concern was whether or not the pilot had received the ATIS information. I am not positive that he had advised as such, nor did his outbound stage III strip show it. The student pilot taxied during a very busy time. I feel that if it would have made a difference, having the wind and altimeter information, then possibly I could have-been a contributing factor, if the pilot did not receive it. The aircraft crashed approximately 1 mile WNW of runway 10L.

Comment: Because this was a reportable accident, a NASA ASRS staff member telephoned the reporter to advise him that his report would have to be forwarded in identified form to the NTSB. (This is standard operating practice in such cases.) The reporter stated that he realized that step would be necessary and stated that it is his policy in all cases where official reports are required to send in a NASA ASRS form. However, as the analyst and the reporter talked he elaborated on the basic report. He stated that the pilot was seriously injured. The pilot did take off on an empty tank and did not realize that he had a fuel management problem when the engine quit and therefore did not select his other (full) tank. Tower personnel were communicating with the pilot throughout the entire sequence even to the point of making suggestion that he use carburetor heat but no one thought to ask him whether he had checked his fuel selector and boost pump.

In a follow-up conversation the reporter was asked whether ATC personnel had a handy check list for use in circumstances of such emergencies. The reporter said no but it would be useful idea especially for controllers like himself who are not pilots. He went on to explain that the only reason that carburetor heat was suggested to the pilot was that there were no pilot controllers in the tower cab at the time of the accident and that was the only idea that any of the controllers could come up with at the time. He went on to say that a good basic check list would have been extremely useful under these circumstances.

2a. Submitted by the pilot:

Flight 123 departed Washington during daylight hours for Indianapolis. Takeoff, climb, and cruise were normal. Indianapolis Center cleared us to turn 10° left and maintain that heading till receiving Dayton then the Clark 1 STAR to Indianapolis. We were cleared at FL 240. I was flying. After passing Dayton, the Center cleared us to cross 30 miles east of Indianapolis at 10,000; 250 knots.

During descent to 10,000, Center recleared us to maintain 14,000 ft. Our descent rate was approximately 2500 ft per minute at Mach 0.80. This clearance was received passing FL 210. Passing through FL 180, the Before Landing Preliminary Check List was completed. While descending through 13,000, the following four events occurred almost simultaneously but in this order: (1) First Officer said something like "Weren't we cleared to 14,000?" (2) I realized we were out of 13,000 and that was wrong. (3) I applied full thrust and rotated briskly toward 15° nose up as Center asked our altitude and said climb to 14,000 immediately. I was operating the Auto Pilot in split axis at this time. As we passed through 13,000, I noted a flight of jet fighters out the left side window, moving aft in the window. Indianapolis advised they noted we were level at 14,000. I would estimate the fighters were 1 mile off our left wing when I first saw them. I noted the altitude alert system was still set at 10,000. As I was reaching to reset the selector to 14,000, Center cleared us to 10,000. Descent was initiated and the remainder of the flight was routine to Indianapolis. Causal factors: (1) Aircraft has altitude alert system which provides a 500 ft to go descending aural alert. Alert system was set on 10,000 ft and not reset to 14,000 ft when revised altitude clearance was received. (2) This crew operated this aircraft on two previous flights this day and altitude alert system was apparently used properly. (3) A distraction, unknown to any of the three crew members, apparently caused the inadvertent oversight of not resetting the altitude alert system to 14,000 ft when altitude restriction was imposed. (4) Subconsciously relying on a device installed as a backup system: an ever-present trap on sophisticated aircraft that a pilot must constantly guard against.

Notes: (1) The mandatory requirement for aircraft to advise ATC when leaving an assigned altitude and reaching an assigned altitude might have provided an earlier alert to the pilot of descent below an assigned altitude. (2) Cockpits of today's jet airliners are so loaded with aural and visual "backups" that can light up or sound without any change in normal operating procedures that they lull pilots into false security.

2b. Submitted by air traffic controller:

Flight 123 was on the Clark arrival to Indianapolis from over Dayton descending to 14,000 ft. He was stopped at 14,000 ft by me and given the reason, a flight of four fighter aircraft to be crossing him 1000 ft below his assigned altitude. As I began issuing traffic to the flight I noticed his altitude readout to be 13,700 ft and descending; at that time I had approximately 5 miles lateral separation on the aircraft. I gave the flight immediate climb to 14,000 and turned the fighters right to a 090 heading and descended them immediately to 10,000 ft. After they had passed, I thanked the fighters for their maneuver (they had to climb to avoid the transport). The fighter pilot stated that if he had not taken evasive action he would have taken the tail of the transport off with his aircraft.

2c. Submitted by controller:

Flight 123 was on arrival to Indianapolis on a Clark 1 arrival. Fighter flight was on a return route from R3401 to Ft. Wayne, Indiana. Flight 123 was cleared to 10,000 ft when the altitude was changed to 14,000 ft by the radar controller. Flight 123 rogered for the 14,000 ft. The radar controller further explained that 14,000 was for IFR traffic at 13,000. Flight 123 also rogered on the explanation. I was working the Indianapolis and Muncie sectors as a radar handoff controller. I noticed that flight 123 was leaving 13,700 ft and I advised the radar controller. When he looked 123 was leaving 13,500 ft. The radar controller immediately told flight 123 to climb to 14,000 ft. The fighter flight was then told to turn right to heading of 090 and descend to 10,000 ft immediately. The next altitude readout I observed on flight 123 was 12,700 ft. The targets then merged.

I don't know why flight 123 failed to maintain 14,000 ft. Possibly the pilots didn't reset their altitude warning device.

2d. Submitted by military flight safety officer:

At the approximate time noted above, leading a formation of four jet fighters, I heard Indianapolis Center tell a flight 123 to climb immediately. He had traffic approaching from his left at the same altitude. At about the same time I saw a jet transport at my altitude, crossing right to left perpendicular to my flight path. I instructed my flight to pull up and break right which we did missing the jet. We came approximately within 1000 ft horizontally and at the same altitude as the jet transport. At the time of the incident my flight was level at our assigned altitude of 13,000 ft. After the incident was over, the controller told me that the flight had been assigned 14,000 in a descent and had flown through that altitude to 13,000 ft. My aircraft had altitude readout capability which was in operation at the time.

2e. ASRS analyst's comments after discussion of the occurrence with the transport pilot:

The trip was scheduled from a midwest city to the east coast and return on the same day. The crew reported at 0550 hours requiring them to get up at around 0330 hours.

The previous evening was quiet and did not involve any social engagements. The pilot retired at 10:00 p.m. The pilot had been flying as Captain for his airline since 1970. The first officer had flown as first officer only a few times after being a flight engineer for 9 years. The second officer had been flying for 8 years. When the crew checked in at dispatch, the first officer asked the Captain if he would fill out an evaluation form for him as it was required during the upgrading program for new first officers. The Captain later said that he should have paid more attention to the fact that he was flying with a new first officer but since he had been flying with fully qualified first officers he paid little attention to this. This was the first time the First Officer and Captain had flown together.

The first leg went well with no problems observed. The Captain flew the first leg with the First Officer acting as co-pilot. After the landing at the first stop, the Captain observed the First Officer to be rather slow in changing to ground control after clearing the runway; he asked the Captain if he could go over to ground control. The First Officer flew the second leg into Washington National and

only a few minor problems were observed. The landing at National was a little long but adequate. The crew was on the ground at National for about 40 minutes and then departed for Indianapolis. The Captain was flying this leg. On all previous legs proper callouts were made and the altitude alert systems operated normally. The flight was cleared to FL 280 and maintained FL 280 for the entire route because of thunderstorms in the area. They were originally cleared to FL 310. The flight was cleared from over Dayton as stated in the report and the Captain was planning a "fuel economy descent" into Indianapolis. They were cleared to FL 240 and descended to that altitude. They were later cleared to descend to cross the 30 DME arc of Indianapolis at 10,000 ft and 250 knots. Passing through FL 210, Center recleared them to 14,000 ft for crossing traffic at 13,000 ft, a flight of four fighters. This is the point where the problem occurred. At FL 210, the pilot not flying (in this case the First Officer), should have reset the altitude warning to 14,000 ft. He did not. Going through FL 180 the Before Landing Preliminary Checklist was initiated and completed. The First Officer and/or Flight Engineer should have called out of 15,000 ft for 14,000 ft, but this call was missed by both crew members. In addition, the pilot flying should have caught the mistake. He did not. As they passed 13,000 ft the controller and at the same time the First Officer and Captain realized that they had descended below the assigned altitude. The Controller had to make an immediate climb and simultaneously the Captain applied maximum power and rotated to get back to the assigned altitude. In conclusion, the altitude alert was not reset properly. The required call out of 15,000 for 14,000 ft was missed by all crew members. I feel that the crew relied on a mechanical backup, the altitude alert, too much and allowed themselves to be led into a false sense of security by a "backup" system.

Examples of multiple reports are shown below (reports 3, 4, and 5; also 10, 29, and 44). Numbers 4 and 44 are examples that show substantial discrepancies among reports; the others agree fairly well, although in No. 29, the second report added significantly to the information in the first.

3a. Reported by a pilot:

Type of aircraft, single-engine biplane: August 1976, I was returning to Boulder. I was making my final leg to Boulder estimating the airport at 6:15 p.m. Entering from SE of Boulder I observed smoke to indicate the winds from the east and proceeded over north Boulder for a straight-in approach from the west landing on Runway 08.

I observed light traffic at Boulder and proceeded to pattern altitude, 6100 ft, at approximately 28th street and was at 500 ft west of Hayden Lake and trees at which time I was checking traffic again and observed another biplane in the pattern on its downwind leg. I proceeded to make slight corrections for a normal landing on 08. Throttle was closed from time of descent. Across the numbers, when contact was made with the other aircraft, my aircraft pitched up and the right wing touched the runway. I applied power and leveled to land rolling off the runway to the north and killing the engine. No evasive action was taken at time of contact.

The condition developed because of poor visibility from the other aircraft being in a steep turn configuration.

3b. Submitted by instructor pilot:

Airplane, single-engine biplane: On the date and time described I was giving flight instruction in takeoffs and landings to a private pilot. After several previous landings we were crossing the threshold of the runway when I heard a loud noise from the rear of the aircraft. At that time I took control of the aircraft from the student and landed it. After landing and deplaning I discovered that the tail wheel of my aircraft had contacted the propeller of another biplane which was also in the process of landing. At no time did my student or I observe the other aircraft in the landing pattern. The other aircraft also made a safe landing with damage only to the propeller.

At the time of day (late afternoon) traffic on base leg and final approach for runway are extremely hard to see because of mountains in the background. Neither aircraft was equipped with radios and UNICOM is not usually manned at that time of day. It is my opinion that excessively large traffic patterns, which are being flown by several aircraft, are a definite contributing factor to this type of incident. Smaller patterns allow aircraft to be seen better.

4a. Submitted by general aviation pilot:

Aircraft, four-seat, low-wing, retractable gear single-engine aircraft. Cruising under radar advisories from Dover AFB eastbound heading 110° at 3500 ft MSL; TAS 150 knots. Eight miles E of Dover, approach called "traffic 11 o'clock, 4 miles," I responded "looking." Ten seconds later I saw a very large military transport at 9 o'clock about a mile southbound and it looked as though it was my altitude, and of course it was closing fast. I immediately did a right descending spiral turn rolling out level at 2000 ft MSL heading 100°. I looked left and saw the transport in a climbing left turn out of a heading of approximately 290°. I called approach and inquired about the "near miss." They ignored the query and seemed to "fake" radio transmission difficulty to me until, of course, I departed their area, when they said "call sign squawk 1200, radar service terminated." I believe that they made what could have been a fatal error in the separation of two aircraft, both under positive control, both in clear VFR conditions. I requested a tape readout; the request was forwarded.

4b. Submitted by military flight safety officer:

The light aircraft was transiting the Dover area at 3500 MSL operating VFR and in contact with Dover RAPCON for traffic advisories. The transport was holding at Tide intersection at 3000 MSL operating with Dover RAPCON under IFR control. The light plane was called by RAPCON and advised of the transport at the 4 mile point; he acknowledged and stated he had the transport in sight. The transport started a level left turn from 253 to 073° and reported the light aircraft in sight approximately 3/4 of a mile away while passing through a southerly heading. The light plane evidently took evasive action by turning and diving. The turn and dive by the light plane and the turn by the transport probably created an illusion to the light plane pilot that they were closer than 500 ft vertical and 3/4 miles horizontal separation. The light airplane operator advised Millville radio that he was going to file a near miss.

After reviewing the controllers' statements, RAPCON tapes, and interviewing the transport crew members, the investigating officer determined that a near miss did not occur. The light plane operator acknowledged and called the transport in sight at 4 miles. When the transport turned, the

aircraft had 500 ft vertical and at least 3/4 mile horizontal separation. The large size of the transport must have created an optical illusion to the light plane pilot and caused him to feel that his aircraft was in closer proximity to the transport than it actually was. There may be some confusion in the mind of the civil pilot as to what radar traffic advisories are and separation requirements for VFR traffic.

5a. Submitted by pilot:

I was Captain on flight 123, August 1976, A to B and B to C. On our inrange contact with Company at B we asked for minimum fuel which was 16,000 pounds. Landed at 0003 and were in at 0006. We were 10 minutes late. On the trip to B we did not eat dinner as the flight attendants were busy. At B, we decided to eat dinner on the ground. We did the check list and noted that we were not fueled, but as fueling is often a last minute thing when a flight runs late, we felt no concern and felt sure that the vendor would fuel it. We hurriedly ate and I went back to put away the tray and was prevented from returning to the cockpit by boarding passengers. I finally got into the cockpit, strapped in, and was given the starting signal. We started up and taxied to nearby runway 11 which was very close by. On each takeoff, I always note the flaps in takeoff position and fuel on board. At this particular time, I had advanced the throttles to takeoff power before checking the fuel. I noted the insufficient fuel (9200 pounds). Dispatch fuel was 16,000 pounds, but since power was up I elected to continue takeoff and upon release to departure control, I asked for landing clearance and landed 8 minutes after takeoff. (Off time 0032Z, on time 0040Z.) I returned to the ramp, refueled, and once again continued my flight to C. Upon arrival at C (my home base), I contacted my chief pilot and related the incident to him.

5b. Submitted by crew member:

Flight 123 was scheduled out of A at 2255Z. Actual departure 2308Z, off 2317Z but we made up time so that arrival at B was 0003Z, on at 0006Z, in at 0008Z, scheduled burnout 6100 pounds, only 10 minutes late.

I called in the times and fuel aboard (9300 pounds), and in view of the fact that our layover was short I proceeded to set up the cockpit for departure, get the clearance, and discuss the outbound passenger and baggage load with proposed time out with the agent. Then the Captain and I both had our dinners, completed final items (except the unfortunate one) and taxied to runway 11. (In view of the speeded up activity this is not unusual and we expected fueling to be completed before taxi; we just failed to double check.)

Since the runway is so close, it usually is a race between taxi time and flight attendant preparation, so I hurried to complete final checklist items to give myself time to double check with the cabin attendants to make sure they completed the passenger briefing and oxygen demonstration.

I noticed we had insufficient fuel for dispatch on pulling up the gear and immediately notified the Captain who had apparently already decided to return forthwith. Out 0030, off 0032, on 0040, in 0043 (scheduled burnout to C 6000 lb). Extenuating circumstances: last leg of trip; running late but making up time; dependable station with good performance record; weather "severe clear" to C;

no reason to be suspicious of fuel load on "eyeing the weather." Good performance record of station made us less likely to double check on fuel.

Reports 6, 7, and 26 illustrate the range of recommendations received from reporters to ASRS.

6. Submitted by pilot, regarding "Northern New Jersey area including all airports in vicinity of New York TCA; in this case, specifically Linden Airport":

When IFR or VFR into Linden Airport, I usually use Newark Approach Control. When within the New York TCA, aircraft are under positive radar control. However, upon descending below the TCA for landing at Linden, one must UNICOM-1,122.8 MHz. The controller ends radar service usually 3 miles from the airport and the pilot is then suddenly thrown into a situation where he must try to obtain the active runway while also avoiding numerous aircraft in the immediate vicinity. The pilot must use U-1 which is very crowded and is often forced to circle outside the traffic pattern at Linden until he obtains the active runway. This further aggravates the air traffic crowding conditions.

Solution: Assign a unique frequency to Linden Airport. There is a large amount of traffic (both student training and cross country) in and out of the airport. The high volume alone warrants assignment of a separate UNICOM frequency. Implement FCC proposed changes to unclutter UNICOM, docket number 20123, as soon as possible. Note: The pilot entering Linden cannot climb into the TCA to overfly the airport in order to get the active runway visually. The pilot must therefore rely on UNICOM.

7. Submitted by controller:

Heavy thunderstorm activity in the area caused long ATC delays. However, the major cause for alarm was a radar loss of over 3 hours. Commercial power was *not* interrupted. ARTCC radar remained on the air and operational yet there was no attempt made by ARTCC to continue to provide radar service into the terminal area. Departures were delayed for 2 hours (approximately) while controllers from Approach Control drove 40 miles in hazardous weather to the ARTCC to man their radar and provide terminal radar service.

Non-radar procedures are inadequate and dangerous for the most part due to the fact that the controllers are not properly trained on non-radar procedures and are not kept current.

Procedures should be implemented to provide training to ARTCC controllers to prepare them for future radar failures. There is something wrong with one of the busiest terminal facilities in the country having to work out-dated, old-fashioned non-radar procedures when the ARTCC radar is still turning and capable of providing much needed radar service.

Report No. 8 discusses the problem of inadequate understanding by general aviation pilots of the concept and procedures of special VFR clearances. It illustrates a class of problem that is

encountered fairly frequently: many pilots, including some professionals, are not fully cognizant of the contents of part 1 of the Airman's Information Manual.

8. Submitted by controller, concerning training of general aviation pilots:

Weather: partial obscuration 20,000 broken, 2-1/2 miles smoke and haze, below basic VFR minimums. Special VFR operations were in progress as I worked the local control or tower position. A light training aircraft called me over Coyote Hills, approximately 5 miles north of the airport, requesting landing instructions. As I was quite busy with the SVFR operation I told him to stand by, maintain VFR conditions. It was about 5 minutes later that I had time to return to him and at this time I asked him his position. He said he was right downwind abeam the numbers on the approach end of runway 30, the runway in use. I had other aircraft in the control zone on special VFR. I saw the airplane over the departure end of runway at about 1000 ft. I had just departed another aircraft, so I had the light plane make an immediate left turn and enter left traffic for runway 30 and issued him a special VFR clearance to get him on the ground. The pilot was asked to come to the tower. Upon his visit, I learned he did not know what special VFR is. He stated he held a private pilot license and had accumulated about 100 hours of flight time.

I am reporting this incident to point up the fact that we have many pilots who do not know what special VFR is. I encounter them often when on duty in such conditions. Apparently they are not being taught this subject in their instruction for a license. When they encounter it they do not know what it is or what to do, so I must waste valuable time trying to explain it to them over the air so I can at least get them on the ground. I propose that *all* applicants for a private license be tested on their knowledge of SVFR flight and demonstrate their knowledge of this subject to the satisfaction of the examiner prior to being licensed to fly as a private pilot. Instructors should make it a point to take their students out in SVFR weather while the student is still receiving the instruction and to log this in the student's logbook. The other point is that pilots do not realize that they cannot enter an airport traffic area or in this case a control zone until they have been told to do so by the controlling facility. When told to hold outside the area at some geographic point or when told to stand by, they routinely continue inbound which complicates my efforts to safely control traffic in the vicinity of the airport. These two points should be taught during primary training and should be a part of biennial flight reviews until we can get these pilots educated, hopefully before we kill someone.

The ASRS has received many reports of problems related to Terminal Control Areas. These will be discussed in greater detail in a subsequent ASRS publication. One TCA which poses special problems because of its location and the density of its air carrier traffic is the New York area. Report No. 9 discusses one class of problem in this area. Another is cited in appendix A, AB No. 21.

9. Submitted by airline transport pilot concerning air taxi operations:

A problem area continually plaguing us particularly in the Air Taxi facet of aviation has been with circumnavigating the New York Terminal area during IFR operations. Whenever IFR operations require a flight, say, from the Trenton/Allentown area to Albany, Hartford, Boston, Providence, and points north and east, the assigned routing results in flights west to east Texas

VOR, Snyders intersection, etc., then north to Wilkes-Barre/Scranton, PA VOR, Wilkes-Barre, PA, Lake Henry VOR before proceeding on course.

This added routing necessitates up to an additional 250 miles per round trip, adding greatly to the trip expense and embarrassment to the crews involved, thus needlessly devaluing the capabilities of charter operations. My suggestion is to provide overland corridors through the terminal area to provide quick, efficient, and safe mixing of combination airline and general aviation traffic with minimal delay.

Operations now require that we cancel the IFR clearance as soon as practical in VFR conditions and continue direct to the destination airport, or proceed in marginal VFR conditions beneath the weather while continuing persistent vigilance while cruising at 175 knots or more. The amazing consideration is that after canceling the IFR to go direct, on top, we rarely see the conflicting inbound New York traffic assumed to be the reason for the circumlocutory routing.

Approach and landing problems are discussed in reports 10–13. Report 10 is a penetrating analysis of an occurrence involving errors in decision-making by the crew of a transport aircraft. Two crew members submitted reports which agree in substance, though 10a is particularly useful because of its careful evaluation of the entire problem.

10a. Submitted by an airline transport pilot:

We flew a ferry flight from ABC to Boston in a 4-engine jet that eventually took 2 hours and 15 minutes. Approaching Boston we were given a hold and an estimated approach time. Fuel calculations were done and decisions made about the length of hold which could be accepted. We were cleared down in the stack as the field had opened. We got ready for the approach and landing. The field then closed, and we were given another hold. We recalculated fuel endurance. The field opened, we were cleared in and made an approach to 04 right with a decision height of 408 ft QFE. We set the radar altimeter to 408 planning to use barometric altimeter for decision height.

The Captain was flying the aircraft, using the coupler. Approach was normal until crew realized at about 300 ft radar altimeter that the runway environment had not been found and further that the airplane was proceeding down and was now well below decision height. We initiated a missed approach with some confusion as it was unexpected and unwelcome and there was an autopilot usage problem as the Captain was relatively new on type. We again held, fuel now getting more critical. Next approach was commenced with the three pilot crew admonishing themselves at the unprofessionalism of the previous approach and determined to exercise more caution with this next approach.

Approach was normal until 408 ft QFE. Runway was not in sight but lights were strongly glimmering up through the fog. Again, however, really without deliberate intent, the airplane was eased below the legal decision height which at approximately 300 ft enabled the crew to see the runway very well. Several other aircraft had just landed ahead of ours. We landed without incident though most of the runway was used.

Factors interrelated in the incautious and illegal approach were: (1) crew deadheaded from west coast to XYZ. (2) Crew flew charter from XYZ to ABC. (3) Crew ferried empty aircraft to BOS. No passengers, no cabin crew. (4) Flight crew was getting physically tired even though duty day eventually ended at only 2100. (5) Flight crew all same age and personal outlook, giving no cockpit dissention, no deference to age difference as well as cockpit status. (6) Flight left ABC with much cockpit joviality planning for changing of deadhead itinerary because of long layover ahead and a feeling of accomplishment at having pleased charter group deposited at ABC. Flight crew at this stage had mentally "switched off" and ferry leg was to be routine. (7) Approach into Boston was made with the mental attitude that the day's work was over; the aircraft was empty and therefore the responsibility was somehow less. (8) Since the aircraft was empty it therefore could be maneuvered more violently "if necessary." (9) The holding delay was considered a "nuisance" and an obstacle to the quick completion of the flight. The fog was considered in this way also. (10) Aircraft had been landing ahead of us on a runway that used to have limits 200 ft lower, therefore at 408 ft there simply could be no problem or danger. (11) The crews' simulator training with the airplane had been to category II, 100 ft minimums, with callouts at appropriate heights and most certainly very carefully below 500 ft QFE. But go-arounds were always initiated at 100 ft DH, not 408 ft QFE. The crew was conditioned by training to go on down to at least 200 ft DH and then pull up. (12) The radar altimeter light comes on at 1000 ft and frequently at other times due to the electrical system quirks of this fleet. And of course, at 2500 ft. The DH light tends to lose its effectiveness because of over-exposure. (13) The flight crew, knowing they were 400 ft above ground, did not immediately appreciate the significance of the DH light coming on *again*. That it was the final warning. It was too early in the approach; the airplane was "too high"; it was an ILS approach to a long runway; missed approaches aren't executed way up here was the thinking, as a result of constant training and retraining to much lower minimums. (14) The crew had a touch of "destinationitis." They had mentally made up their minds that they were going to terminate the duty period in Boston, especially as their deadhead aircraft from another carrier had by now presumably departed or canceled.

Moral: Don't break minimums, ever. Don't assume an instrument approach will be successful. Anticipate a go-around when getting close to decision height. Appreciate that some approaches are not to the absolute extreme used in training sessions. Appreciate that an approach continued down below conservatively high minimums can just as easily result in disaster as one to category II.

10b. Submitted by airline transport pilot:

This report is written by the Captain of the airplane following the submission of a similar report by the co-pilot.

Is a precision approach always a precision approach? The approach in question is runway 4 right, Boston, ILS to a DH of 408 ft. After discussion with a crew that actually experienced confusion about minimums and procedures I decided to write up their experience.

The weather was fog, night, visibility variable but showing 6000+ RVR on approach. The Captain flew the airplane on the autopilot coupler. At a DH of 408 ft he admitted to trying to level off with the altitude hold which would not engage. He then disengaged the autopilot and flew for about 30 seconds at an altitude of 350 ft. The co-pilot during this time admitted that he spent some moments trying to decide which altimeter he should read for DH callout. All crew members

admitted that they were not particularly concerned about being 60 ft below DH, because 408 ft is high as minimums go and all knew that that minimum had been 250 ft.

I think that the significant point to be made from this experience is that we are trained and retrained to precision approach minimums of 200 ft and 100 ft, and if nothing is seen, go around immediately. Therefore, it may be difficult and confusing to adjust to 408 ft. being in fact a DH point at which a go-around must be executed.

Add to this the fact that 6000 ft RVR is being experienced, other aircraft have landed, and a touch of "get-homeitis" is felt, and we have a potentially serious problem. A related problem is that the 408 ft decision height is not compatible with the 3/4 mile visibility. Even with the 6000 ft RVR, at 408 ft the airplane could be 1.3 to 1.5 miles from the runway on a 3° glide slope.

I recommend that a minimum not be called a decision height when it is above 250 ft. All crew members in the discussion admitted that "DH" automatically means precision, but in no way did they consider 408 ft precision.

Report No. 11 describes a problem which appears frequently in ASRS reports: confusion among pilots as to the proper frequencies for advisory communications at uncontrolled airports. There appears to be widespread misunderstanding or lack of understanding among general aviation and air taxi pilots of the applicable section of AIM part 1, page 1-25. It is hoped that this report can highlight the confusion and serve as the basis for educational efforts to overcome this pervasive problem.

11. Submitted by student pilot:

Light aircraft on VFR flight plan, Merced to King City, Mesa Del Rey Airport. I flew over airport at 3000 ft MSL, observed tetrahedron and windsock to show runway for use as 11. Five miles NE of airport I closed out my flight plan with Salinas Flight Service Station, then I switched to 122.9 and reported my position, and I continued to report my position on crosswind, downwind, base and final. As I was on final a light training aircraft came in on final on 29. I added power, called a go-around, then made a landing on 11. Other pilot insisted: (1) He was on right frequency of 122.8. (2) Runway 29 is "preferred runway." (3) Runway 29 is the instrument runway. (4) Runway 29 is the VASI runway.

When I pointed out that the tetrahedron and windsock were lined up with runway 11, he stated "those are variable." My reply, "yes, variable as the wind." The airport attendant confirmed runway 11 was the correct runway.

Checking with a Flight Service Station for the correct frequency resulted in an incorrect frequency. Checking with other pilots, I had been advised that I should have been communicating on: 122.8-123.0-122.3 – and I don't know what else.

Checking with another FSS – no commitment.

There seems to be enough confusion on the frequency to be used at uncontrolled airports. Reviewing the situation with my instructor, he advised me that the correct frequency for an uncontrolled airport is 122.9, and other instructors agreed. But ask other pilots, and the answer for the majority is 122.8. So there is confusion or AIM part 1, page 1–25 is incorrect.

My conclusion is: (1) many pilots do not know all of the correct frequencies, (2) there are Flight Service Station representatives who do not know the correct frequencies, and (3) I think flying would be safer if this situation was clarified.

Reports 12 and 13 describe another problem that has been frequently reported and which has been associated with some potentially serious pilot errors. The time immediately after touchdown is a period of very high workload in high speed aircraft. The cockpit environment during this period is not conducive to clear reception of ATC instructions, yet it appears that initial taxi instructions are often transmitted during rollout. Controllers need to be aware of the high workload and high noise levels in this phase of flight and to avoid whenever possible initiating transmission until the aircraft has turned off the active runway.

12. Submitted by airline transport pilot:

Our flight, after having been slowed for minimum spacing behind a heavy jet, was cleared to land on runway 9 right. The two aircraft following on approach were also slowed due to minimum spacing. A routine landing was accomplished. Due to the close proximity of the approaching aircraft an expeditious turn was made on the first available high speed exit, taxiway X-ray. Having received no transmissions from Tower to hold short of runway 9 left, and having made a visual check, flight crossed runway 9 left on to Taxiway Papa. Flight was then instructed to contact Ground Control, and a normal taxi was accomplished to parking area. Shortly following, both pilots of the flight received notice to report to their chief pilot's office to hear a tape recording. The tape was made in the Tower which included the portion pertaining to the landing of this flight. The tape revealed two transmissions from the Tower for the flight to hold short of runway 9 left, possibly made during the rollout or highspeed exit phase. Neither transmission was received nor acknowledged by the flight. Another aircraft was cleared for takeoff on runway 9 left. (This transmission was not received by our flight.) The tape also revealed two transmissions from another aircraft making reference to the flight. This possibly caused the tower controller to assume that our flight had received or acknowledged one of the above transmissions. The first and only transmission received and acknowledged by our flight was to contact ground control after having crossed runway 9 left on taxiway P. At no time was flight made cognizant of anything other than a routine operation. The aircraft that was cleared for takeoff on runway 9 left obviously made a normal takeoff. If at any time our flight had been made aware of any abnormality the cockpit voice recording would have been pulled for review.

Factors: (1) Excessive air traffic congestion apparently necessitating minimum spacing for landings as well as takeoffs. (2) High cockpit noise level due to reverse thrust. (3) High workload for 2-man crew executing high speed exit and after landing checklists and procedures. (4) Radio reception difficulties. (5) Aircraft being cleared for takeoff without receiving acknowledgment to hold short from landing aircraft on close proximity runway. (6) The crossing taxiway (P) for runway 9 left is virtually at the end of the high speed exit (X-ray) runway 9 right.

13. Submitted by general aviation pilot:

The particular ATC procedure that I believe has potential for an accident or incident or excessive aircraft wear is the procedure wherein tower operators direct transmissions to aircraft during the rollout portion of landings. In particular are directions for airplanes to turn off at specific taxiways or movement areas. The interpretation that student pilots and/or others make of directions received from the tower is that requests are mandatory operating requirements. An example would be an airplane "cleared to land," then during rollout the controller might state "turn left at the next taxiway; hold short at the parallel, contact ground 121.6." The pilot's interpretation would often be to use whatever brake or control use is necessary to comply with that "request." Clearly the controller is attempting to clear the runway so that other operations can take place.

My points are: (1) the operator of the aircraft is the only person able to determine the ability of the aircraft to negotiate a particular turnoff. Admittedly the pilot, if unable to turnoff or comply with any ATC directive, should proceed with safely operating the airplane and advise ATC as able. However during the stress of the landing segment and also in an attempt to be helpful, pilots often brake very heavily thereby potentially skidding, nosing over or damaging components or the steering mechanism. (2) If the need for expedience on the runway is observed by the controller he should be able to tell prior to the time the airplane lands and advise the landing pilot prior to the landing, or adjust the spacing of following or departing aircraft. (3) I am not convinced that all pilots are aware that statements of ATC persons are to be complied with as able and are not mandatory. (4) Any transmission to the pilot while he is on the runway during the rollout phase distracts attention from the immediate task at hand. (5) Runway ice, passenger interference or wind conditions, etc., may be factors for the pilot that the controller may be aware of and that may further preclude prompt action by the pilot. (6) In conclusion, the pilot should be left with a stated authority to operate the airplane and unnecessary transmissions which tend to be redundant should be eliminated. (7) The possibility of passenger or pilot injury as the result of heavy braking because of loose objects or loose seatbelts is a hazard. Again those situations should not exist but if they do the potential for harm is present.

Problems related to limited-visibility approaches and airport lighting are highlighted in reports 14 and 15. The latter exemplifies several reports regarding shortened approach light systems at locations which have until recently had full systems. This change has provoked severe criticism from pilots who conduct all-weather operations into the affected airports.

14. Submitted by airline transport pilot, flying wide-bodied jet:

Regarding this incident: Both captain and first officer had the same impression with regard to altitude at critical point on approach, but no conversation between crew members took place until the next day.

The situation: A completely standard ILS approach to runway 28 right San Francisco with all checks, lists, callouts, etc., as required by SOP, was made. Weather approximately 400 overcast ragged ceiling and lower scud with good visibility on runway. About 600 ft on approach we encountered windshear which required application of thrust to regain slight loss of airspeed. At

approximately 400 ft, became ground contact and flight officer announced "rabbit" in sight, then approach lights in sight. My outside glance confirmed position at approach lights, but altitude seemed to be unbelievably *high!* My temptation was to push over and descend but better judgment called for a cockpit instrument check which was made – not once, but twice. By this time runway lights were in sight and altitude seemed normal. Autopilot was disconnected approaching minimums and normal landing followed. We were fortunate to have a glide slope reference. Had the approach been made without a glide slope the action of either or both pilots would be hard to predict and could have resulted in an incident or accident. I believe the confusing impression of higher than normal altitude resulted from our seeing only the ALSF II lights under restricted visibility with no other reference. Pilots using this system should be advised to use extreme caution to avoid erroneous action in similar conditions.

15a. Submitted by a pilot:

I just wanted to write this to call your attention to what appears to me to be an alarming trend in "cost effective" cutbacks in approach lighting systems. On ILS approach to runway 31 at Sioux City Municipal, Sioux City, Iowa (Chart date: September 3, 1976), weather measured 200 ft obscured in rain and fog, RVR runway 31, 4000 ft. Upon reaching minimums we had the approach lights in sight but something unfamiliar about the visual cues alarmed us. We seemed to have a harder time transitioning from instruments to visual. We realized later that "lateral visual clues" were lacking due to a SSALR setup. It is my opinion that if the FAA is going to go to this type of setup that they should raise the DH accordingly. With the reduction in visual cues the pilot simply needs to go to higher minimums. At the regular 200 ft minimum the pilot will not be able to maintain the proper "picture" he otherwise would with the regular ALS. We need to standardize or there will be accidents. We have several sight pictures at 200 ft DH in existence at this writing. A pilot used to the regular ALSF-1 who encounters the short version SSALR at the same weather conditions and DH may get into trouble. One accident or go-around will far exceed the money saved with the so-called "cost effective" program. I also wonder how they justify all this when the control towers leave their ALS on bright all night after the tower closes.

15b. Submitted by a controller:

The Dallas-Love Field approach light system (ALS) was recently modified to delete the ALS and replaced with SALS/REIL. With this system of fewer lights the sequence flashing lights (SFL) are on at all times that the approach lights are on. In good weather these SFL lights are not only not needed but are much too bright. We have received many complaints from pilots on approach that the flashing lights are not needed, are too bright, or we are requested to turn them off but to leave the rest of the approach lights on. Tower controllers have no control over any of these situations other than to turn off the entire approach light system. This entails a lengthy explanation to the pilot each time and the ALS is then turned off and on numerous times each night.

15c. Submitted by pilot and controller:

At approximately 2155Z XY123 landed runway 31 at Sioux City Municipal Airport and the pilot advised he did not like the approach lights being reduced in number. He felt that this

constitutes a safety hazard. It appeared to him because of the minimums for an ILS 31 approach and the DH at 200 ft that the approach light system should be operating at 100%. Because of energy conservation the approach light systems have been altered here. The number of cross bars as well as the sequence flashing lights have been reduced approximately 50%. As an Air Traffic Controller and commercial pilot I am in complete agreement with the pilot. We have developed a system to operate at a maximum and now are operating at a minimum. The agency advises it is an economy move and an energy saving means. Let us not be penny wise and pound foolish when we are providing service to the public. This is definitely a safety factor. This facility is shut down from midnight to 7 every night. Before leaving we turn the ALS to step 3, runway 31 and 35 lights to step 3 for an all night operation.

Night flying for the pilot with limited experience poses specific problems which require emphasis. A pilot who encountered such problems submitted report No. 16.

16. Submitted from a private pilot:

I had not flown much night flight within the preceding 4 months. Prior to incident as soon as I could log night flight on the evening of August xx, 1976 I did my required 5 stop-and-go landings and takeoffs. Then a friend and I proceeded to fly from our home airport to Battle Creek, Kellogg Field. After becoming airborne and gaining sufficient altitude I tuned in the BTL VOR. Unfortunately I did not pay too much attention to it. Instead I navigated toward a rotating beacon that I thought was BTL. I noticed that my VOR needle had a right deflection and a "To" indication, but still I navigated toward the beacon. When I was approximately 10–15 miles from the beacon (presumably BTL airport) I called the BTL tower for landing instructions. BTL tower instructed me to enter right base for runway 4. Upon entering traffic pattern, I could not pick out runway 4. After communications with BTL tower for assistance in finding correct runway, I determined I was not at Battle Creek, but I was at Kalamazoo instead. By this time I was well into the Kalamazoo traffic pattern. I was still talking to BTL tower. I established contact with Kalamazoo tower and proceeded to Battle Creek Airport. Luckily I did not cause a disorder or accident at Kalamazoo Airport.

Note: This type of an incident could very easily cause a serious accident. I thought it important that I bring this matter to both my and your attention. After this happened to me I do not feel that the night flight currency requirements are enough. I feel that just going out and doing five stop-and-go takeoffs and landings within 90 days does not always make a good competent night flight pilot, especially if you are away from night flying more than 90 days. I do not want to sound like I am blaming the FAR's for what happened. I'm not! This is what you would call pilot incompetence, neglect, recklessness, bad flight planning. Now I would like to point out a few ways this particular incident could have been avoided. (1) I should have been doing more night flying. (2) Better flight planning: used a combination of: (a) pilotage, (b) dead reckoning, (c) radio navigation, (d) file VFR flight plan. (3) The final and most important point I would like to stress is this: Too many pilots nowadays are taking their flying too loosely. Myself for one. Something too many pilots forget is this. Flying is an exact science. If procedure is followed properly 99 times out of 100 everything will run smoothly.

Face it. Some of us pilots just have to clean up our acts. Thank you.

Weather problems are generally less severe during summer months, but such problems still occur and are reflected in ASRS reports. Number 17 is one of only a few reports to date which have involved flight well beyond individual capabilities. His initial decision regarding the weather and his subsequent decisions after encountering it pose some interesting and important human factors questions in view of the prevalence of weather-related accidents in general aviation.

17. Submitted by pilot:

I was on a cross country VFR flight to Bar Harbor, Maine, over cloud layers. I contacted FSS enroute and they reported Augusta and Bangor below VFR minimums, but Portland on the coast was still VFR. I decided to continue on top VFR and descend for a look at Bar Harbor conditions. I descended about 1815 local through a hole in clouds VFR over Frenchman's Bay and started toward the airport. No answer received on UNICOM frequency. Conditions deteriorated rapidly and I realized the field was IFR so I attempted to return to the opening in the cloud layer but was not able to locate it. Also the ceiling was dropping below VFR minimums. Fog was moving in also. I had to descend to 500 ft to stay out of clouds. I attempted to call Flight Service Station and Tower in Bangor, but was too low for distance and terrain involved. I am not instrument rated or possess approach plates for Bar Harbor. I decided to monitor 122.8 for aircraft announcing IFR approach and attempt a localizer approach to runway 22 at the airport. Using ADF to find the Surry NDB, I made low level turn trying, but not always maintaining, visual ground contact while following the localizer signal to the runway. I tried this about 10 times without sighting the runway. Then UNICOM was manned by someone who had heard my engine overhead. He queried me as to my problem, equipment, ATC clearance, experience, and ratings. He tried to assist me on a couple more localizer approaches. Conditions were getting worse, with fog obscuring the ground. The UNICOM operator was in contact with Bangor FSS and then directed me to climb to 3000, intercept the 330 radial to Bangor VOR and call approach on my radio. Approach assisted me in attempting localizer intercept for runway 33 at Bangor. I was also given a transponder code and position radar identification was made by Boston Center. My radios both began showing intermittent off flags on the localizer (this I later determined was due to a loose antenna cable connector and antenna splitter feeding both NAV receivers). Informed of my intermittent localizer problem, Bangor approach handed me off to Boston Center for radar vectoring on the localizer path. Boston Center did a superb job of talking me down on a no gyro approach. I had intermittent ground lights visible at 800 ft MSL and solid ground lights at 450 MSL with 4 to 6 miles visibility below the clouds. I then landed at Bangor runway and after parking determined I had 6 gallons of usable fuel left. I had two passengers aboard.

Hindsight tells me I should have landed at Portland while I was still VFR instead of going to Bar Harbor for a look. A few more questions on my part on a preflight telephone weather briefing would also have been appropriate. I received extensive information on a frontal system on my flight path, but accepted a phrase to the effect of weather being OK at my destination, if I made it through the front.

Two examples of weather-related airport problems are shown in reports 18 and 19. The confrontation between operational and environmental concerns is clearly stated in the latter report.

18. Submitted by controller regarding airport intersection:

During and up to 30 minutes after a heavy rain shower water accumulates sometimes, it appears up to 6 inches in depth at the intersection of runways 12 right and 24. Many times since my arrival here I have experienced aircraft reporting hydroplaning at this intersection. This intersection appears to me to be at a very critical spot in reference to landing and departing aircraft. When landing on runway 12 right aircraft touchdown just prior to this intersection or right at it. The same thing applies to landing on runway 6. When arriving on runway 30 left or runway 24 it is at a point of running out of runway. The airport layout is provided in a sketch. Suggest a drainage sewer be installed or that intersection be resurfaced so as to allow proper runoff.

19. Submitted by a pilot:

Good summer weather in New England except that unforecast sea fog moves in with easterly wind of 10 to 15 knots. Ceiling and visibility variable and decreasing but averaging about 200 obscured 1/2 in fog when we wanted to land. This weather is predictable at Boston at various times and should be considered by those making decisions about NAVAIDS. Let's look at the Boston runways and associated NAVAIDS. 4 right would be best except for a 400 ft decision height based on assumption that ships are in the channel. In 12 years nobody has figured out how to determine if a ship is, in fact, in the channel.

15 right: A vocal minority in the Boston area has prevented the FAA from installing a CAT II ILS. Result: No approach lights, no middle marker, offset localizer, 250 ft decision height, 3/4 mile visibility required.

33 left has a good CAT I ILS but it's pointing the wrong way for sea fog. With the crosswind exceeding 10 knots, 300 and 3/4 is required.

Our flight went back to Providence. I say that safety decisions of the FAA are being vetoed by local political decisions of people who also want the benefits of safe air travel.

Reports 20–32 discuss a variety of air traffic control and flight crew concerns. Most involve human errors in decision-making and procedures typical of those which are reported to the ASRS on a daily basis. Such reports constitute a unique body of data regarding human behavior in the aviation system. Further analyses of these data will be carried out on a continuing basis and may increase our understanding of how to minimize errors and their untoward effects in aviation operations.

20. Submitted by an airline check pilot:

On touch and go landing with 800–900 ft ceiling, tower ordered pilot to remain VFR. Clouds bellied down to approximately 400 ft over water on downwind leg. Pilot forced to stay beneath circling minimums to stay VFR. (GPWS "pull up" warnings were a constant irritation during this approach.)

21. Submitted by an airline pilot regarding an approach at Dallas-Ft. Worth Regional Airport:

Was turned high left downwind for 17L at 11,000 ft MSL on STAR by approach (weather – CAVU). Asked for lower; told by approach "unable." Was cleared to 4000 ft, turned to base by approach at about 6000 ft aircraft altitude. Was asked if airport was in sight – it was – cleared for visual approach. On close high base, told approach control that we would have to widen out to right to make normal approach. Was told that we could not do this – if we could not turn final from present heading would have to "box" us out to east – and could not go through final because of 17 right. Decided to make power off full flap approach to land without delay. Made S turn to east. On short final tower cleared a heavy jet for takeoff ahead of us.

I believe that when a pilot is cleared for a visual approach he should be able to make his normal approach and not be forced to "dive" at runway in order to keep his landing turn.

22. Submitted by controller:

XY 123, jet transport, departed Milwaukee, and was issued FL 200 and heading 290 by Chicago Center. I then issued same to the aircraft, then the aircraft was changed to Center frequency. Some minutes later the Center controller stated the pilot came over and stated he was issued a 200 heading and a climb to FL 290. After monitoring the tapes I found that I had erred and issued a heading of 290 and FL 290; however, Chicago Center did amend the altitude.

23. Submitted by airline transport pilot flying wide body aircraft:

While level at assigned 15,000 ft, we received a clearance to 8000 ft. As we passed through 14,000 ft, approach control cleared us (XY 26) to descent to 13,000. Our reply repeated the 13,000 but asked about the earlier clearance to 8000. Traffic was heavy and we did not get a satisfactory explanation. A short while later we heard a clearance for 26 and an AB trip 26 also called in and asked if it was for them. The controller said no, AB, it's for XY26. AB then requested the controller to more distinctly identify the carrier as he was unable to tell who he was calling. From there on the clearances were better. We had received and read back the clearance to descend to 8000 and were not questioned.

For your information controllers usually do a very fine job. Problems of the type mentioned here occur most often in the New York area and at Philadelphia airport. It is not unusual for better controllers to advise each carrier when they have the same number, then issue further clearances as "XY26 XY" and this helps.

Careful enunciation and identification will prevent repeats of this nature and aid in preventing the probable traffic conflicts to which this exposes us.

24. Submitted by airline transport pilot:

Cleared into position for takeoff. When cleared for takeoff our last two flight numbers same as another carrier. Tower operator not too clear with identification and I, hearing last two numbers,

sounded correct to me. Power applied for very short distance when another aircraft started to cross runway at far end. I knew immediately we were wrong or he was wrong, aircraft was stopped and I taxied back to taxiway for another takeoff.

Similar flight numbers caused this, my being not too alert and controller giving takeoff instructions maybe a little too quickly caused me to assume another flight's takeoff clearance.

25. Submitted by controller:

This incident does not involve a compromise of safety as such. It is, however, an example of a continuing trend on the part of air carrier pilots flying into the XYZ airport to show disregard for controllers. I was working the northwest sector of XYZ approach control at approximately 1800Z. I was very busy at the time vectoring two flights of fighter aircraft, also a commercial jet to a sequence for runway 19. Another company's flight had been put on a vector for runway 29 (the landing runway). The first company's jet had been vectored to runway 19 at his request and the military jets were vectored to runway 19 since 19 was the longest runway aligned with the wind. The second company jet advised he was canceling IFR which I acknowledged and repeated the heading to be flown to the runway; the pilot then asked where his traffic was. I didn't answer as I was very busy with the aircraft landing on runway 19. The carrier pilot continued to ask the location of his traffic, tieing up the frequency for control use and generally aggravating the situation. I finally advised the pilot of that flight to maintain radio silence unless an emergency existed and issued vectors and handed the aircraft off to the XYZ final controller.

Similar type incidents have occurred at XYZ with other scheduled air carriers. On one occasion an air carrier canceled IFR and refused to follow instructions issued by the controller. There is one thing, evidently, that air carrier pilots are not aware of: XYZ has a TRSA and controllers are required to provide separation to participating Stage III aircraft in the TRSA when they call XYZ approach, unless the pilot *states* he does not want the service. When a pilot cancels his IFR flight plan he automatically becomes a Stage III aircraft and will be provided Stage III service unless the pilot states he does not want it. I have a feeling air carrier pilots think they are "beating the system" when they cancel IFR. They are in most cases simply creating problems for controllers since we are still required to provide instructions and we don't have time to explain to the pilots, on the frequency, the predicament they have put themselves in by canceling IFR. Management in most cases is reluctant to make a telephone call to the air carrier operations in cases where pilots are creating these problems. Even if such calls are made the problems are still occurring.

I stated at the start of this narrative the incident did not compromise safety. As I write and think more about this situation I feel safety to some extent has to be compromised if the controller becomes frustrated with non-cooperating pilots.

26. Submitted by controller:

The safety hazard in this report is the possibility of military aircraft, conducting training operations, deviating from assigned airspace and coming into conflict with civil aircraft either inside or outside positive control airspace.

A tanker and a flight of two fighters were assigned a block altitude of FL 250 through FL 280 in the AR603 refueling area which is west of Phoenix to Prescott, Arizona line. Control of the aircraft was released to an Air Force control and warning unit.

I was working position D92, Albuquerque Center Sector for the airspace of which the refueling track is a part. At about 1545Z USAF Control requested a change of altitude for the refueling flight because of weather. The new altitude block was assigned and the tanker aircraft was observed to climb. No target for the receivers was observed because it is standard procedure for receivers to refuel with transponders on standby. At about 1555 the receivers contacted Albuquerque Center Sector 43 at 15,000 ft, on a VFR flight, requesting clearance to an initial approach fix and an approach to their Air Force base. The Air Force control was questioned about the location of the receivers and asked to explain how the receivers could go from FL270, block altitude, in controlled airspace, to below FL280 which is 9000 ft of controlled airspace, without a clearance from Air Traffic Control. The particular individuals involved have had a full discussion with Albuquerque Center and have promised not to make this mistake again.

My purpose is not any further action against the individuals involved in this particular incident but rather to use this incident to highlight what I believe is a chronic potentially dangerous situation. Within Albuquerque Center, and other Centers also, many portions of airspace are assigned to the Military for training. Three methods of assuring that these military aircraft are kept in their assigned areas and clear of civil aircraft and other military aircraft are used. They are listed in their order of effectiveness. (1) The air traffic control assigned airspace and military operating areas are under direct control of the Center. Special sectors have the responsibility to clear the military aircraft to and from the area and to monitor their track while in the assigned area. The military aircraft are assigned a special working frequency while in the area. This frequency is available to the sector controller to use in turn, climb, or descend the military aircraft when their track will depart the assigned airspace. (2) Military aircraft are controlled to and from the MOA's by the FAA. Once in the assigned airspace, the military aircraft are released to military radar facilities which are responsible to keep the aircraft within the assigned areas. (3) Military aircraft are controlled to and from the MOA's by the FAA. Once in the assigned airspace, the military aircraft are released to a tactical frequency and the individual pilots are responsible to remain within the assigned areas. UHF guard frequency is sometimes available to the individual center controller to use to alert the military aircraft when they are observed departing the area. Frequency coverage of the guard channel varies from good to non-existent.

In case (1) above, occasional deviations outside the assigned area occur. Causes include poor geographic frequency and coverage, poor communications with maneuvering aircraft, loss of transponder returns of maneuvering aircraft, failure of pilots (especially students) to effectively monitor the assigned frequency, and sometimes controller inattention or errors in correcting observed deviations.

In case (2) with military radar controllers responsible, many more deviations occur. Some of the causes listed for case (1) undoubtedly contribute to the military controller errors. An additional cause is a low level of training and proficiency of the military controller. The military controller's lack of knowledge of ATC procedures and lack of proficiency is evident by observation of the results of their control and by their response to control instructions and requests for clearances in coordination with FAA controllers.

In case (3) I believe the major cause of the numerous pilot deviations from assigned airspace is a casual attitude about the seriousness of the responsibility for the pilot to remain within his assigned airspace on the part of individual pilots.

Recommendations: For case (1) where FAA ATC specialists are responsible for keeping military training aircraft in assigned airspace, improvements in frequency coverage, pilot training, and controller training and supervision will decrease the number of incidents.

For case (2) where military radar facilities are responsible, the major problem is military controller training. I recognize the military problem of frequent turnover of personnel but this will be an unsatisfactory excuse if a midair collision between a military and civil aircraft occurs. A two-part training approach is recommended. (a) These military controllers are currently required to periodically tour the Albuquerque Center and observe ATC operations. Today, this is casually conducted. The requirements should be amplified and improved to include formal classroom sessions at the Center and individual training with the military controller assigned a center controller instructor to conduct one-on-one on-the-job training at selected sectors. (b) Selected Albuquerque center controllers would be attached to the military radar facilities to observe operations and conduct further training of the military controllers. In both cases, formal certification of each controller for technical proficiency to operate in the joint environment should be made. For case (3), where the military pilot is primarily responsible for keeping within assigned airspace, the safest (but most expensive solution) is to set up operations where center controllers can monitor and communicate directly and keep the aircraft where they belong as in case (1). In the interim, a hard-line approach by FAA, to include military deviation reports and military commander support, resulting in individual pilot retraining as required, would reduce the number of these deviations.

In summary, the potential for a midair collision between military aircraft deviating from assigned airspace does exist. Short-term and long-term methods of decreasing this risk are available.

27. Submitted by controller:

At approximately 1518Z I working the AR-2 sector at Cleveland-Hopkins. Traffic was heavy. A twin engine turboprop was handed off by Cleveland Center at the 7RN Sector which is approximately 20 miles south of the airport. The aircraft called and said "Cleveland Approach Control, this is N123 heading 320 descending to 7000." I advised N123 to fly present heading maintain 7000 ft stand by. Approximately two minutes later I observed the Mode C readout on 123's transponder to read 6700 ft.

I also observed XY999 (not sure of call sign or type) at N123's 2 o'clock position and 2 miles SW bound at 6000 ft. XY999 appeared to be turning S bound. I instructed N123 to stop his descent and to turn left 270°. N123 acknowledged. I then told N123 that I believed I had assigned him an altitude of 7000 ft. He replied that I was correct.

I believe this situation occurred because of human error, and I have no idea on how to prevent it from happening again other than eliminating the human factor. ARTS made this incident known and prevented anything from happening. The pilot's attitude was very good. He admitted his error and explained over the telephone what had happened. He was cooperative and concerned. I doubt if

this pilot will ever have this happen to him again. At no time did I see an altitude less than 6700 ft. The pilot said he might have gone as low as 6600 ft. The ARTS served its purpose.

28. Submitted by controller:

A business aircraft enroute to Bradley Airport entered my sector via New Castle, DE, New Castle VOR. It appeared the pilot was having difficulty navigating by EWT VOR so he was assigned a 110 heading vectors Robbinsville VOR. He was sent direct Robbinsville and handed off to sector 56 at FL 250. He was now 10 miles NE of Robbinsville when sector 56 called back stating that he requested landing at Teterboro Airport. A 230° heading and descent to 16,000 was coordinated and the pilot was returned to my frequency. It appeared that he was not on the assigned heading and that he was descending below 16,000 ft. Another aircraft east of Robbinsville VOR westbound at 15,000 was issued traffic and took evasive action. I also issued traffic to the twin turbo to climb immediately to 16,000. Targets passed at very close proximity.

After the incident the turbo pilot was once again issued a heading of 230° vectors to Teterboro Airport for descent and traffic. Pilot questioned the heading stating that it was erroneous for Teterboro and that he had a passenger on board needing to go to the bathroom. Eventually he took all control instructions and was turned over to approach control. After landing at Teterboro the pilot was told to call Center. His statement over the phone was that the approach map slipped off his lap and when retrieving it his aircraft descended below the authorized altitude.

29a. Submitted by commercial pilot. Aircraft: large twin-engine turboprop.

On landing at Barnes Airport, while doing a walkaround I discovered a gallon can of glycol hanging out of the wheelwell attached by a rubber hose. After a close inspection I saw that it had done some damage to the bottom of the nacelle, evidently incurred when gear was retracted. This can was overlooked on the preflight because it was up in the wheelwell out of sight.

29b. Submitted by pilot of large twin-engine turboprop aircraft:

On an empty leg during a charter flight it was noticed that four retraction cycles were required to get up and locked indications on left main landing gear. Problem was discussed with maintenance on radio and was told to keep going, that cold weather up lock problems were suspected.

Upon landing at Barnes after a 50 minute flight an inspection of the left wheelwell revealed a filter, the size of a coffee can, attached to a one-foot hose, which had prevented gear from coming up and locked on first try. Another aircraft was ferried in for my charter.

I believe the chief cause of this incident is working procedures for maintenance. The mechanic that had worked on this aircraft that afternoon had been pulled off this job several times and on top of that the aircraft was repositioned on the ramp during this work order. I suggest enough maintenance people be on a shift so a man can be left on the job till finished. As far as the inspector goes, I have no idea how he could have missed this filter. The filter is a ground service unit only and should have been removed after the mechanic had finished.

30. Submitted by pilot:

On departure from Newark, New Jersey the flight was cleared on a Somerset Five SID. Takeoff on runway 4 right called for right turn to 060. At 2000 ft Newark departure cleared flight direct to Solberg VOR. Already in right turn flight understood clearance to read continue right turn to Solberg VOR. Departure, after realizing flight's continued right turn, questioned heading, then cleared flight "right turn heading 270." This misunderstanding occurred during a critical workload on Flight Crew resulting in a deviation from prescribed clearance.

31. Submitted by controller:

Corporate jet inbound to Champaign was asked inbound radial to Champaign and DME distance. Champaign approach was given 255 radial and 32 DME. Aircraft was 7000, then given 6000 when he reported 20 SW of Champaign. He was told to expect straight-in approach, to maintain 3000 until 10 miles SW of Champaign. The jet was told to monitor Champaign Tower and report 4 DME SW. In the next couple of minutes Tower asked the position of the aircraft. The aircraft was hesitant. About this time Chicago Center called wanting to know why that aircraft was going so far north of Champaign if he was landing at Champaign. The jet called missed approach and was given 5000 ft back to Champaign. No evasive action was needed. Luckily there was no traffic at Danville Airport. Airplane landed at Champaign. This situation has happened several times at Champaign due to close proximity of VOR frequencies. Champaign is 110.0 and Danville 111.0. This is a hazard. I understand this situation has been filed before and nothing has happened. It's time to change. (Fig. 7 illustrates this report.)

32. Submitted by controller:

Columbus Approach Control is normally a radar facility. A new ASR-8 radar system has been recently installed. There have been numerous problems since, requiring the use of non-radar procedures for a long period of time. On this particular morning the radar was officially logged out of service for maintenance from 0700 to 0900. At approximately 0720 Indianapolis Center coordinated an inbound to Columbus on a twin turboprop at 7000 ft cleared for Lancaster Intersection via the 190 radial of Appleton VOR, a common non-radar procedure for runway 28 left operation at Columbus. The Center also advised that pilot reported his right engine running rough but pilot did not declare an emergency. A few moments later the Center called back and advised they showed the aircraft at 6200 ft on an altitude readout. The first call from the turbo to me indicated he was descending out of 5500 ft. I advised him to maintain 6000 and then proceeded to find out his intentions and what altitude he would prefer reference his engine trouble and because he was still about 30 miles from Columbus Airport. The pilot advised he wanted direct to Columbus and descent through overcast to go VFR underneath the clouds and advised that 4000 would be OK to start with. He was recleared to Appleton VOR direct to maintain 4000 and when able to navigate to Summit Station outer marker (final approach fix for ILS 28 left) proceed direct which would be 5 miles east of airport. We were advised of his position a few times with the help of Center radar, but their coverage at lower altitude is not good in this area. The Center finally advised that he was about 10 miles SE of Lockbourne AFB indicating 2400 ft on readout. The pilot concurred and said he was in VFR conditions but did not want to cancel IFR. He was advised to maintain 3000 ft and that he was off course. Pilot advised he was having trouble navigating to

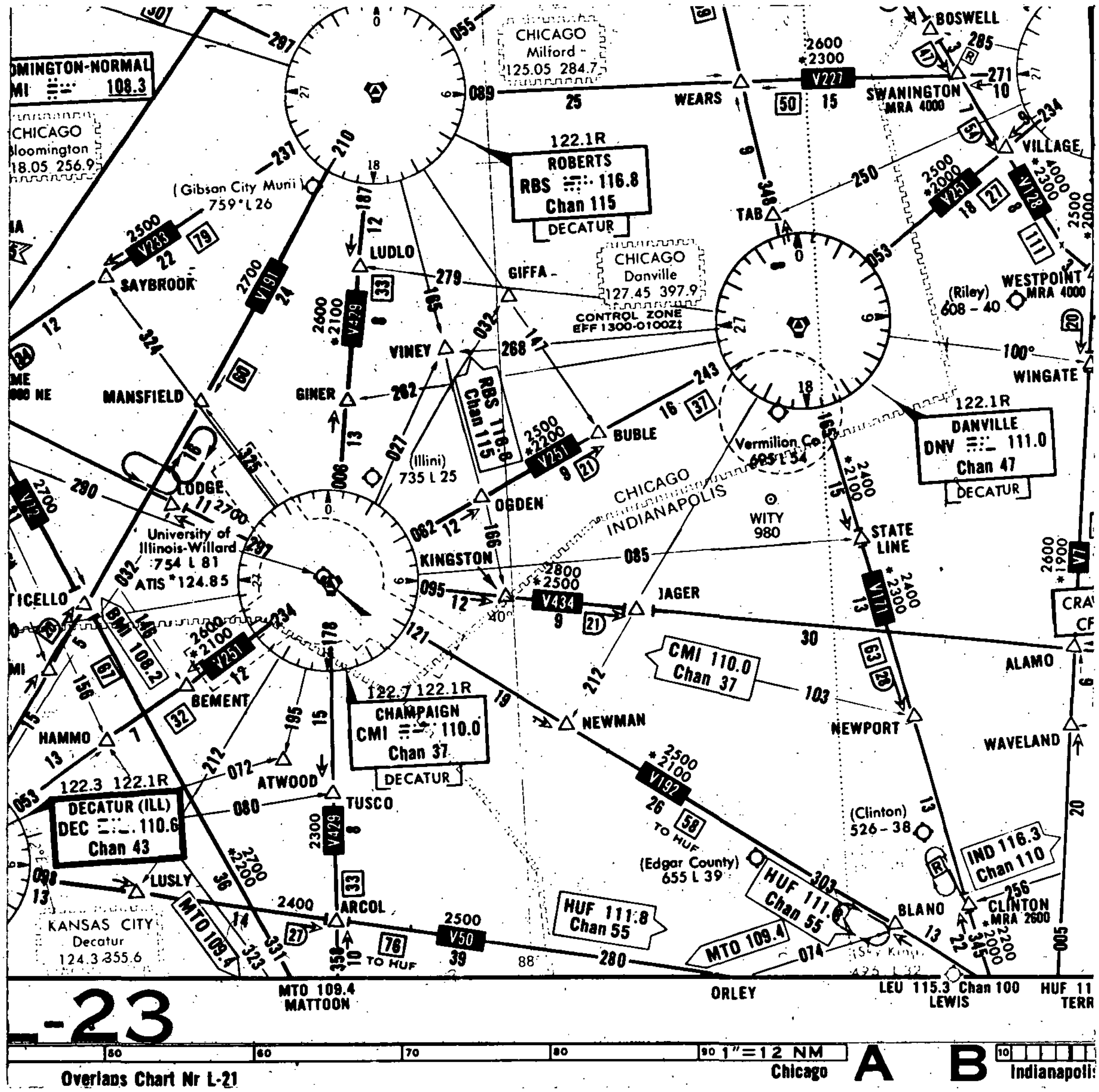


Figure 7.– L-23 enroute chart.

Summit Station LOM. Next transmission from the aircraft he wanted to cancel IFR, was VFR at 1900 ft, request to land at Lockbourne AFB, did not want to try to land at Columbus. The aircraft landed safely at 0736. Lockbourne AFB is 11 miles south of Columbus Airport.

I was working a combined arrival position with no other traffic a factor during non-radar procedures. During this time the airplane was given all pertinent information and requests to expedite his landing at Columbus. At no time would he commit himself to an emergency situation or state that he was having trouble maintaining altitude. He never advised leaving altitudes or

requesting other than 7000 with the Center or other than 4000 with me. The only way we knew he was below altitude was through the help of Center radar and his verifying reports. We finally declared an emergency situation to Lockbourne tower when we found out that he wanted to land there, an airport you normally have to get permission to land at as a civilian. Fortunately, he was close to that airport and landed safely when it was discovered that he had a major problem.

I feel that there are too many pilots who are afraid of declaring an emergency for one reason or another and who do not take advantage of all the help available to them. A controller must be kept informed of the status of his flight and any significant problems affecting the whole operation to be of assistance as much as possible.

Contributing Factors: Radar service not available at Columbus Approach Control due to outage for maintenance adjustments. Hours of 0700 to 1000 in morning is a peak traffic period for Columbus. Radar should be worked on at another time of day or night when traffic should be less. Pilots become used to having radar service and vectoring for expediting flight instead of having to fly on instruments on full approach to an airport in a non-radar environment. Engine trouble would compound the problem for both pilot and controller. Lack of communication from pilot to controller on the actual seriousness of his problems and when he is unable to comply with ATC instructions. Possible lack of experience of pilot during emergency situations and procedures. Radar not being available compounded his problems.

Suggestions to prevent recurrence: Have radar service available as much as feasible. Pilot should declare emergency and leave no doubts as to his status. Pilot should give as much information to controller as possible during his flight especially that which is required, and together they can work out the best solution. More training flights and closer watch on proficiency checks.

Nonradar procedures are not easy for controllers to work when they are used to providing better service with radar with minimal delays.

Reports 33–36 exemplify problems related to equipment within the system (see also appendix A, AB's 19 and 20). Number 33 concerns maintenance of ground equipment and is typical of numerous complaints related to inopportune scheduling of such maintenance. Report No. 34 deals with placement of cockpit controls. Numbers 35 and 36 are concerned with aircraft warning and alerting systems, a frequent source of complaints to ASRS and the focus of considerable human factors research at this time.

33. Submitted by controller:

Nashville, TN, radar system out of service from 1000 to 1400Z for NADIF adaptation. Huntsville approach radar out of service 1300 to 1430Z for PMI. This placed the Huntsville sector in a potentially hazardous condition. Effective flow control restrictions were not implemented for the outages mentioned above (non-radar separation and no direction flights was flow control restriction implemented). These radar outages affected five sectors. The D man assigned sector D9 had not given or received a non-radar control problem in the past 60 days (his currency in non-radar by regulation was questionable).

Solution: When two radar systems such as these are to be removed from service, coordination to delay one shutdown. Effective flow control should be implemented as situation warrants. Currency requirements on non-radar should be enforced.

34. Submitted from airline transport pilot:

This report is to point out how poor cockpit design caused some cockpit confusion and could possibly cause an accident. We were cleared for a NDB approach to runway 22 right at Newark. Both my first officer and myself turned the single ADF on this aircraft to Bergen LOM (241 KHz) and identified it before starting the approach. Radar vectors to final approach course intercepted us just outside Bergen LOM but too close to tie down the 217° inbound course. My first officer was flying and I put the landing gear down over Bergen LOM. Now inside of Bergen LOM we were unable to see the field due to scattered clouds and smog so we still needed localizer guidance. But now we found ourselves way to the right of course. Left corrections did not help. I then rechecked ADF identification (so did my first officer) and found it was no longer correct. ADF dial checked and was found on about 248 kHz. We could now see runway so continued visual. After landing we figured that due to poor cockpit design in that the one ADF control panel is directly below the landing gear handle when the Captain puts the landing gear handle down with his right hand it is possible to mistune the ADF because his lower fingers brush against the tuning knob.

In this case when I put the gear down I mistuned the ADF from 241 to 248 which we later identified as Bethpage locator. No wonder we thought we were to right of inbound course!

Had this situation resulted in an accident it could only too easily have been called "pilot error." But to me, it is poor cockpit design and should be labeled "human engineering error." Of course, the fix is to simply move the ADF control panel away from the proximity of the landing gear lever.

35. Submitted by airline transport pilot:

Maintenance left center access compartment door open. This door evidently was opened to repair a chronic problem of overheat warning light in this compartment. The annunciator lights are on the same panel with similar wording:

CENTER ACCESS COMPT DOOR	CENTER ACCESS COMPT OVERHEAT

This overheat light is on constantly in some aircraft. Of course, when the door is open, the overheat light is out but the door light is on. Of habit one looks at this annunciator light and assumes it is the ubiquitous overheat warning. As a result of this error, fuel had to be dumped as we could not pressurize aircraft. Landing was made at departing station without incident.

36. Submitted by airline transport pilot:

Takeoff on regularly scheduled flight. Takeoff and climb to 3000 ft. Passing 2000 ft, altitude alert chimes and light illuminates. Recleared to FL 100; passing FL 90 altitude alert chimes and light illuminates. After exiting Berlin air corridor, recleared to FL 230. Passing FL 220, altitude alert chimes and light illuminates. Initial descent: cleared to FL 120; passing FL 130 altitude alert chimes and light illuminates.

Recleared to 5000 ft: passing 6000, altitude alert chimes and light illuminates. Recleared to 3000 ft: passing 4000 ft, altitude alert chimes and light illuminates. Passing 3500 ft, pilot was distracted by heading change and localizor intercept and failed to level at 3000 ft.

Passing 2700 ft, altitude alert chimes and light flashes. This warning was ignored by the pilot and the descent continued. At 2500 ft, the co-pilot called out "altitude" and the pilot leveled off at 2300 ft and climbed back up to 3000 ft. Flight continued without further incident.

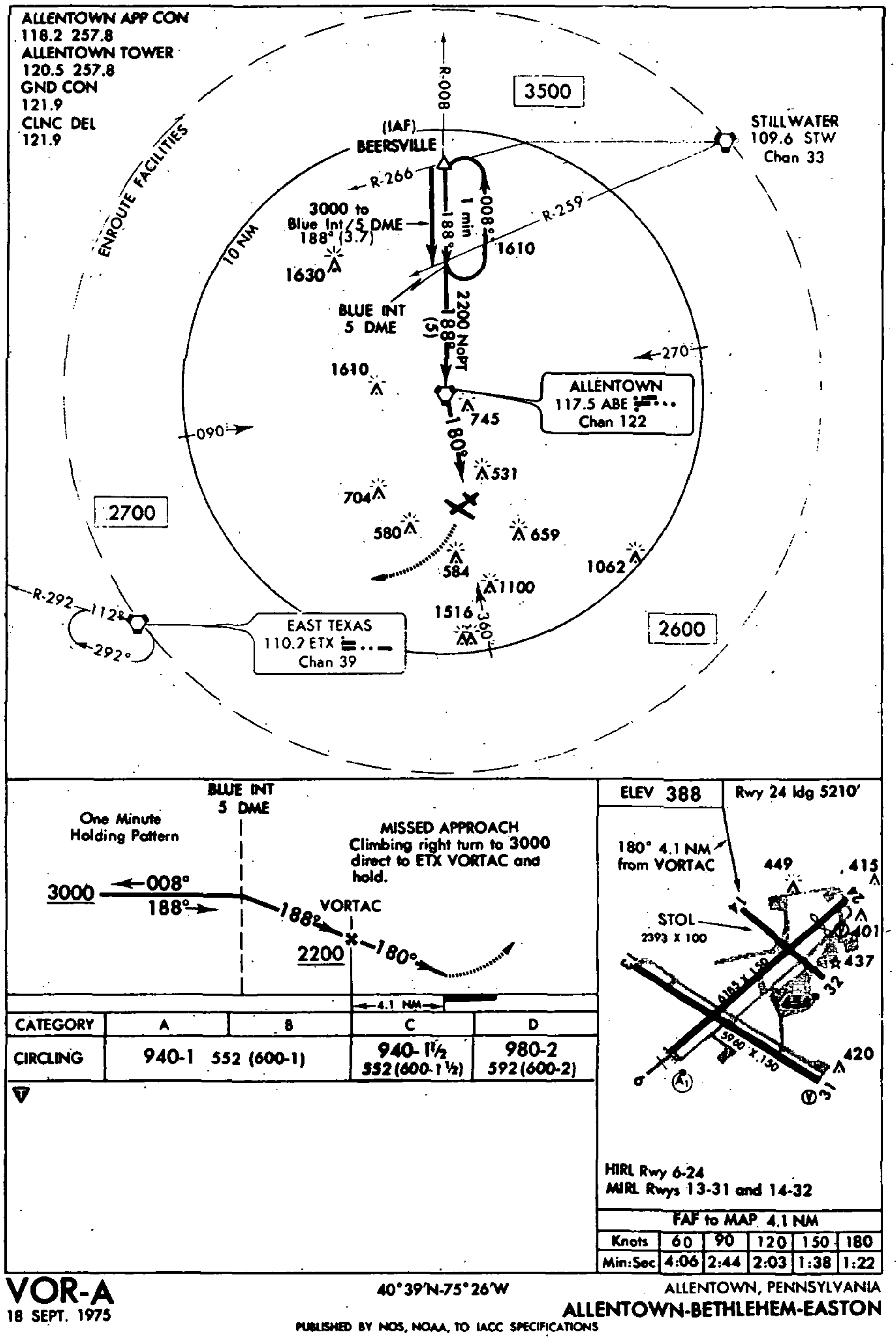
This incident illustrates poor system design in which a "warning sound" is heard repeatedly during normal operation. The "warning" sound becomes a normal sound and its warning value is negated. In order to be effective, a warning sound should *only* be heard when there is a discrepancy. In our operation, each pilot hears this "warning" sound approximately 360 times per month. Now, if once every 6 months a pilot makes an altitude error, he is faced with hearing a "warning" sound to which he has been conditioned 2000 times in normal operation to ignore. This is an FAA requirement and should be changed. The light should be retained as at present, but the sound should only be heard during an abnormal operation such as altitude error. (Note: This proposal is the subject of a current NPRM.)

Publications and procedures give rise to a continuing flow of reports. Report 37 deals with portrayal of an instrument approach; report 38 is one of a continuing series concerning the procedural requirement for maintenance of airspeed limitations below 10,000 ft, a requirement too frequently overlooked by foreign air carrier pilots operating into New York. Report 39 deals with a possible ambiguity in weather information transfer to pilots.

37. Submitted by controller regarding VOR-A approach, Allentown-Bethlehem-Easton Airport:

This problem was discovered by observing several aircraft that when executing the VOR-A approach via own navigation to VOR then procedure turn which should start at the Blue intersection (5 nautical miles North of ABE VOR) but were, still are in fact, proceeding outbound to Beersville intersection (20 nautical miles North of ABE VOR) and commencing a procedure turn from Beersville intersection. Approach altitude from Beersville to Blue intersection is 3000 ft. Sector altitude north of Beersville becomes 3500 ft. By the approach plate, procedure turn altitude is 3000 ft. If a procedure turn is executed from Beersville with maneuvering north and east (which is incorrect) the aircraft in many cases entered the 3500 ft sector altitude area. This could be hazardous. In recent days over half of the aircraft that I have worked making this approach have conducted the approach incorrectly. Upon advising the pilots of the observed deviation they seem to see the mistake right away. It is my belief that the approach plate (AL-15) is misleading pilots to

make the procedure turn mistake. Blue intersection is poorly depicted on the chart. This approach plate needs review. (Fig. 8 illustrates this report.)



CATEGORY	A	B	C	D
CIRCLING	940-1	552 (600-1)	940-1½ 552 (600-1½)	980-2 592 (600-2)

Knots	60	90	120	150	180
Min:Sec	4:06	2:44	2:03	1:38	1:22

Figure 8.– Approach chart AL-15.

38. Submitted by controller regarding Bohemia arrival sector, JFK Approach Control, N.Y.:

XY006 a four-engine turbojet on IFR arrival to JFK. Noticed excessive ground speed readout on ARTS track data and asked pilot his indicated airspeed. Pilot replied 310 knots. Aircraft was operating over continental United States at 4000 ft MSL. Advised pilot of speed requirement and reduced XY006 to 210 KIAS for vectors to airport.

39. Submitted by an airline transport pilot:

Our landing charts are prepared by the second officer. A quick scan of ATIS might yield an altimeter setting of 3008 (actually wind) instead of 3016, written as 016. During Cat II approach you would be 80 ft low. An insidious threat brought about by such changes as teletype weather written 3008 instead of the old way (300/08), use of ATIS for landing info, side by side presentation of wind and altimeter. I have suggested that a separate block on card be used for altimeter setting.

Potential conflicts between aircraft in flight are a constant source of concern to pilots, controllers, and the public. Examples of reports of such occurrences are shown in reports 40–44. Report 40 illustrates a possible problem in the design of the Standard Instrument Departure involved. Report 41 is self-explanatory. Report 42 may have been due to a misunderstood clearance. Report 43 is one of several regarding VFR aircraft overflying metropolitan areas above TCA upper boundaries. Number 44 illustrates another problem which has been reported several times: that of VFR aircraft crossing ILS approach courses at altitudes used by aircraft making the approach. If the VFR pilot is navigating by reference to sectional charts, he may have no way to determine that he is at an altitude which brings him into conflict with IFR traffic. It may be that such information would help to minimize this problem. Note also the discrepancies between the two reports of the same occurrence.

40. Submitted by airline transport pilot regarding Laguardia Airport, N.Y., Whitestone Climb:

On takeoff at LGA using runway 13 with a Whitestone climb, the procedure is to climb to 1500 ft on a 170° heading then turn left to a 040° heading, etc. We were fairly heavy for this takeoff. Right after our turn to 40° started (I, first officer, was flying) Departure Control told us we had traffic off to our left which had made the takeoff behind us. Since we were in a left turn with about 25° of bank I, on the right, could not see much off to our left. I did notice the captain staring out the left window. Very quickly afterward he said "I've got it." He pushed the nose down hard and rolled out of the turn saying at the same time and pointing out my side. Looking out my right sliding window I saw the bottom of a corporate jet in his left turn to 40° about 100 yards away.

I believe the reason this conflict occurred was the failure of the SID to specify a point to begin the turn to 40° rather than an altitude, the problem being the two different climb rates of our heavy jet and the lighter corporate jet. There are most likely other SID's and procedures where an event like this could occur.

41. Submitted by an airline transport pilot regarding O'Hare Approach Control:

Air carrier in descent to 7000 ft on vectors to intercept localizer – passing 7500 ft. Sighted light twin at 11 o'clock position 100 to 200 ft above, passing left to right directly overhead. No evasive action possible but would have if sighted earlier. No advisory from Approach Control but did hear aircraft behind being warned of SW bound VFR traffic at 7500 ft and advisories for avoidance. No apparent violation by anyone involved – just another example of system weakness (VFR vs. IFR).

42. Submitted by controller regarding Atlanta area:

Air carrier departed runway 26 at Atlanta-Hartsfield Airport and was told to maintain 5000 ft. The aircraft was turned northbound and advised of traffic, a twin-engine that was inbound from the northwest at 6000 ft. Another aircraft that had departed Atlanta earlier asked for a higher altitude and was given 14,000 ft. The jet which had just departed took the climb of the previously departed aircraft and headed straight for the light twin. The radar targets of the light twin and the jet merged with only 300 ft altitude separation.

I believe the reason for this incident was that the pilot of the carrier jet took instructions issued to another aircraft and climbed to an altitude that was unsafe, in his position, because of the light twin occupying the airspace.

43. Submitted by airline crew member, location 13 nautical miles S of Cleveland Airport at 9700 ft MSL:

We were operating as flight 123, DCA – CLE. The first officer was manipulating the controls. CLE approach control cleared us to slow to 180 knots at 10,000 ft and then descend to 4000. We were heading 320 as we slowed to 180 KIAS. We were given a right turn to 360 and as we rolled into the turn and began descending the flight officer uttered an explitive as we were passing 9700 ft and passing heading of 330. He jerked back on the elevator and then relaxed the control to continue the descent (aircraft attitude did not change). I asked him what had happened and he told me a single-engine low wing aircraft had just slid under us from right to left. He estimated that the other aircraft was at 9500 ft heading west. No one else saw him. We asked Approach if he had the traffic and he said, "I see a faint target merged with your return." Later he said he could see the traffic westbound. We asked him to follow the track to see if the pilot could be found so his story could be learned.

Another pilot told me that he had had a close encounter with a light twin in the same area a few days earlier, not close enough to call a near miss however, and that the controller did not point out the traffic to him. Evidently light planes without transponders fly over TCA's to stay legal. In this case there must be a radar blind spot south of Cleveland and they're simply not seeing the traffic. Because of the small angle of convergence in this case, the first officer saw the other airplane only because of the right bank. Our speeds were most likely very comparable being that we were doing 180 knots at the time. *All* airplanes should have transponders!

44a. Submitted by general aviation pilot, light twin engine aircraft:

I was flying my light twin with my four sons southward toward Houston, TX and attempted to contact Houston Approach Control on several occasions. Contact was finally established and the transponder setting was changed from 1200 to 0636 at the approach controller's request. A large jet was seen approaching the east runway on the ILS course. At approximately 3 o'clock position another airliner was seen approximately 1000 ft or more above my aircraft. At that time, that aircraft was south of the localizer and made a small correction to his left to correct for the center line of the runway. (East runway.) He was about 5 miles west of our position. We were traveling south, he was traveling east. We were at 1000 ft. He was estimated to be about 2000 ft or more. He was also south somewhat of his desired center line approach to the east runway. In addition, I felt that the second jet was too close to the proceeding jet on the final approach and felt that this spacing on approach for landing was not safe situation for the airliners concerned. We never came dangerously close in any way to any aircraft during our flight. Communications, I believe, was a factor, in that the radio clutter made it almost impossible to contact Approach Control at Houston Intercontinental Airport. I did reduce my altitude from 1200 ft to 1000 ft although I do not believe it was necessary for me to take this action. Better communications amongst the aircraft in the area and Approach Control would avert any recurrences.

Note: (appended to this report) On callback, the pilot stated he may have been as high as 2000 ft crossing the localizer course.

44b. Submitted by air carrier pilot:

Final approach controller called traffic moving from left to right across our approach path as we were approaching ILS runway 8 localizer and outer marker. We spotted the traffic visually and with an easy evasive maneuver proceeded behind his flight path. Light aircraft must be made to know that they should never be at outer marker altitude on an active ILS approach runway.

Finally, a report related to parachuting is presented. Parachute jumping on and around airports and on airways poses a number of potential problems (report No. 45). Some specific problems have been cited in alert bulletins. A more general problem is that of providing accurate and timely information to pilots who may find themselves in potential conflict with parachutists. Relevant information may be found in any of several publications depending on circumstances; the information may or may not be known to the agencies controlling a particular flight in an affected area. If the information is known, it may or may not be transmitted to the pilot. This subject will be the topic of a special ASRS study aimed at clarifying the problems.

45. Submitted by pilot of single-engine high wing reciprocating aircraft:

Light conditions: night. Parachute jump school is in operation daily at Spaceland Airpark. Jumps are made with target area approximately 75 yards from approach of active runway 31. Jumps are quite often made during dusk hours or when visibility is poor. Occurrence: October x, 1976, 7:45 p.m. (night). Light aircraft number XYZ dropped parachutists over Spaceland Airpark

after dark. No accident occurred. Aircraft including jump plane were landing during the same period with landing lights on. I feel that these activities within the traffic pattern after dark will eventually cause a serious accident.

Note: AIM Part II does not list this airport as having parachute jumping. However, sectional and VFR TCA chart and also Part IV do list it as being parachute jumping area. In addition, AOPA airport guide does not list this airport as a parachute airport.

NASA-Langley, 1976 A-6860

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—NATIONAL AERONAUTICS AND SPACE ACT OF 1958

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